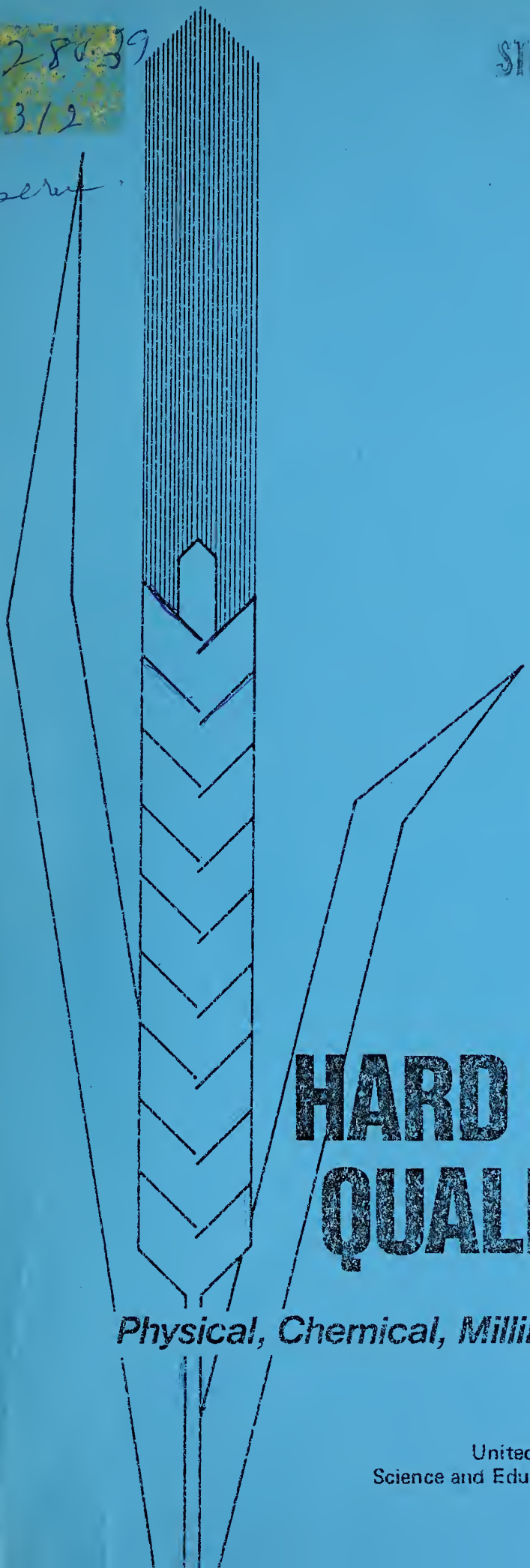
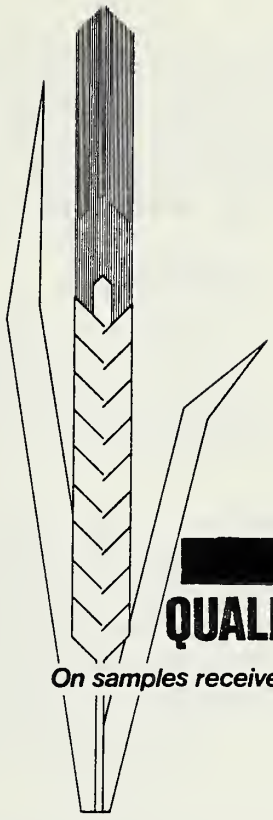
1980 CROP



HARD RED SPRING QUALITY REPORT

Physical, Chemical, Milling, and Baking Characteristics

United States Department of Agriculture
Science and Education Administration, Agricultural Research
North Central Region



[redacted] WHEAT QUALITY REPORT

On samples received from the 1980 crop

Source:

Spring and Durum Wheat Quality Laboratory
USDA, SEA, Agricultural Research
Cereal Chemistry & Technology, N.D.S.U.
Fargo, North Dakota 58105

REPORT OF PHYSICAL, CHEMICAL, MILLING AND BAKING EXPERIMENTS WITH HARD RED SPRING WHEAT

1980 CROP1/

by

R. D. Maneval, Food Technologist; R. D. Crawford, A. A. Ottenbacher, Technicians, D. W. Lillard, Res. Chemist, J. E. Wohlman, Secretary, SEA/Agricultural Research; 2/ L. L. Nolte, and M. Skunberg, Technicians, NDSU; 3/ and V. L. Youngs, Research Leader.2/

Contents

1/ This is a progress report of cooperative investigations containing some results that have not been sufficiently confirmed to justify general release; interpretations may be modified with additional experimentation. Confirmed results will be published through established channels. Cooperators submitting samples for analysis have been given analytical data on their samples prior to release of this report. The report is primarily a tool for use of cooperators and their official staffs and to those persons having direct and special interest in the development of agricultural research programs.

This report was compiled by the Science and Education Administration, Agricultural Research, U. S. Department of Agriculture. Special acknowledgment is made to the North Dakota State University for their facilities and services provided in support of these studies.

2/ Hard Red Spring & Durum Wheat Quality Lab., NDSU.
3/ Dept. of Cereal Chemistry & Technology, NDSU.

1980 COOPERATING AGENCIES, STATIONS AND PERSONNEL

The cooperative agencies and stations conducting the varietal plot and nursery experiments from which the 1980 spring wheat samples were received are listed below:

Arizona Agricultural Experiment Station:

Mesa

Idaho Agricultural Experiment Station:

Aberdeen and Tetonia

Minnesota Agricultural Experiment Station:

Crookston, Morris and St. Paul

Montana Agricultural Experiment Station:

Bozeman, Havre and Sidney

North Dakota Agricultural Experiment Station:

Carrington, Dickinson, Langdon, Minot and Williston

South Dakota Agricultural Experiment Station:

Brookings, Redfield and Selby

Washington Agricultural Experiment Station:

Pullman

Wisconsin Agricultural Experiment Station:

Madison

Wyoming Agricultural Experiment Station:

Sheridan and Torrington

A complete list of all cooperating agencies, stations, and personnel for the year will be found in the report by R. H. Busch, et al., Wheat Varieties Grown in Cooperative Plot and Nursery Experiments in the Spring Wheat Region in 1980.

INTRODUCTION

Samples of standard varieties and many of the new strains of hard red spring wheat grown in cooperative experiments in the spring wheat region of the United States4/ have been milled each year by the USDA. The flours were assayed chemically and physically and baked into bread to determine the quality characteristics. The purpose of this report is to make available to the cooperators, quality data on the standard varieties and new strains of hard red spring wheat from the 1980 crop.

The same general format and techniques were used in evaluating the wheat as outlined in quality reports for previous years. The data contained in this report are comparable to data in past reports and, where applicable, average results and also the average results of other crop years are compared. The area averages are tabulated for the Uniform Regional Nursery varieties of Butte, Era, Chris and Waldron. A four-year average (4-YA) and the averages for the individual four years include all selections grown in the Uniform Regional Nurseries for that year. These results give an overview of individual years and the influence of environment on the crop. The actual crop characteristics may be somewhat different due to differences in varieties, but the change from year to year is applicable.

The evaluation of a sample involves three areas of analysis: kernel characteristics, milling performance and baking evaluation. A brief description of the technique is given on pages 11 and 15 of this report. It is possible to quickly deduce the various characteristics of the selection and any outstanding features or deficiencies which are apparent. No specific comments are made regarding the mixogram patterns, since reference mixograms for each of the general types are presented at the end of the report.

Seeding for the 1980 crop over the spring wheat area was early to normal with severe drought conditions prevailing over much of the area until August. Some areas experienced excess rainfall during harvest which caused some problems. The average flour extraction was 0.3% higher than the 1979 crop and 0.3% lower than the 4-YA.

4/ Busch, R. H., and Quick, J. S. Wheat Varieties Grown in Cooperative Plot and Nursery Experiments in the Spring Wheat Region in 1980. SEA/Agricultural Research, U. S. Department of Agriculture and State Agricultural Experiements Station, St. Paul, MN.

Wheat mineral content was slightly higher than the 1979 crop and the 4-YA. The wheat protein concentration was 0.7% higher than the 1979 crop average and 0.1% higher than the 4-YA. The physical characteristics of the wheat were down slightly from the 4-YA.

The baking performance of the 1980 crop was slightly stronger than the 1979 crop. Mixing times were longer and the dough properties were slightly stronger. Absorption was 1.6% higher than the 4-YA. Flour protein was 0.3% higher than the 4-YA and 1.0% higher than the 1979 crop. Loaf volume was also slightly better than the 4-YA. Oxidation requirements were unchanged.

SOURCE OF THE 1980 CROP SAMPLES

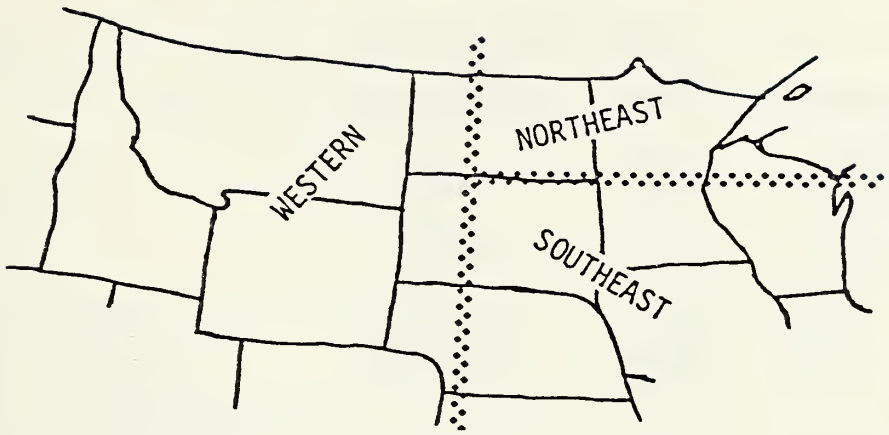
Tests were performed on 1,204 samples. However, data on 527 of these are not included in this report, because this information was of interest to plant breeders at specific experiment stations only. Data presented in this report are from the Field Plot Nursery, Uniform Regional Nursery, International Sawfly Yield Nursery and the International Spring Wheat Nursery. The samples came from the 21 stations in nine states shown below:

Arizona: Mesa
Idaho: Aberdeen and Tetonia
Minnesota: Crookston, Morris and St. Paul
Montana: Bozeman, Havre and Sidney
North Dakota: Carrington, Dickinson, Langdon, Minot and Williston
South Dakota: Brookings, Redfield and Selby
Washington: Pullman
Wisconsin: Madison
Wyoming: Sheridan and Torrington

On page 7 are listed the spring wheats that were included in the Uniform Regional Nursery trials. The variety or cross, the station that developed the variety, the state selection number and the C.I. number are given.

BLENDING AND AVERAGING PROCEDURES USED

Individual wheat samples from the Uniform Regional Nursery originating from the three geographical areas shown in the illustration on page 6 were blended according to area. Only 18 of the 21 stations were compatible for blending. Milling performance, mixograms and baking data were obtained from these area blends. However, data for kernel characteristics are arithmetical averages of individual sample analyses. These data from the Uniform Regional Nursery also are compared with averages from the previous four years (Table 4).



Wheat blends were made according to the geographical areas shown above.

Data from the International Sawfly Yield Nursery were obtained on the individual samples. Table 14 gives the variety averages for the 1980 crop year.

Data for the Field Plot Nursery and the International Nursery are on the individual samples.

ENTRIES IN THE 1980 UNIFORM REGIONAL HARD RED SPRING WHEAT NURSERY

Entry No.	Cross or Variety	CI No. or Sel. No.	Year Entered	Source
1.	Marquis	3651	1929	Canada
2.	Chris	13751	1969	USDA-MN
3.	Waldron	13958	1964	ND
4.	Era	13986**	1972	USDA-MN
5.	Butte	17681	1979	ND
6.	Olaf/MN6792	SD2700	1980	SD
7.	Butte/Eureka	SD2835	1980	SD
8.	Hand/2*WS1809/3/ Oleson/Tobari//Trapper	SD2870	1980	SD
9.	Butte/James 's'	SD2868	1980	SD
10.	ND476/4/Sheridan/3/ Norin 10/Bev. 14//4* Centan	MT648*	1979	USDA-MT
11.	TzPP/Son 64//Selkirk	MT7836**	1980	USDA-MT
12.	Mrn/Tbr 66/3/TzPP/ AN3//B61-136	ID0167**	1980	USDA-ID
13.	Neepawa*6/RL4137	RL4352	1980	Mant.-Canada
14.	Waldron/Era	MN70170R**	1980	USDA-MN
15.	Crim/Era*2//Bui-Gallo	MN73168**	1979	USDA-MN
16.	Crim/Era*2//MN6923S	MN7357**	1980	USDA-MN
17.	Era*/Chris M	MN7222**	1977	USDA-MN
18.	Olaf//ND499/ND516	ND569**	1979	ND
19.	Butte*2/ND507	ND572	1980	ND
20.	ND526/Kitt	ND573	1980	ND
21.	Olaf/5/Jt/ND335/ Pembina/3/Wanken 2/4/ Cis/Wisc 261	ND574**	1980	ND
22.	ND551//Butte*2/ND507	ND575	1980	ND
23.	Waldron/Era	NK75S2634**	1980	Northrup King
24.	Era/Justin	ND75S2631**	1980	Northrup King
25.		HS7664**	1980	No. Amer. Pl. Br.
26.		HS74183**	1978	No. Amer. Pl. Br.
27.		X6753**	1980	Pioneer
28.		X6718**	1980	Pioneer
29.	N7000052/K71053	WA6756**	1980	WA
30.	K71051/WA5949	WA6758**	1980	WA

** Semidwarf

METHODS

The terminology and methods used are briefly described below:

Test Weight Per Bushel - The weight per Winchester bushel of cleaned, dry, scoured wheat. To determine the dockage-free test weight on a comparable sample, approximately one pound per bushel should be subtracted from the value given.

1000 Kernel Weight - The 1000 kernel weight was determined by counting with a Seedburo seed counter the number of kernels in a 10 g sample of cleaned, picked wheat5/.

Kernel Size - The percentages of the size of the kernels (large, medium and small) were determined on a wheat sizer as described by Shuey6/.

The sieves of the sizer were clothed as follows:

Top Sieve - Tyler #7 with 2.92 mm opening
Middle Sieve - Tyler #9 with 2.24 mm opening
Bottom Sieve - Tyler #12 with 1.65 mm opening

Potential Yield - The potential yield is not shown on the computer tables, but it can be determined by multiplying the percentages of the overs of each sieve #7, #9 and #12 by the value of 78%, 73% and 68%, respectively. The accumulation percentage would be the potential yield.

Milling - The samples were cleaned by passing the wheat over an Emerson kicker and dockage tester and through a modified Forster scourer (Model 6). The clean, dry samples were pretempered to 12% moisture for at least 72 hours; then tempered to 16% moisture and allowed to stand overnight prior to milling.

5/ Mention of a trademark name or a proprietary product does not constitute a guarantee or warranty of the product by the U. S. Department of Agriculture, and does not imply its approval to the exclusion of other products that may also be suitable.

6/ Shuey, William C. A Wheat Sizing Technique for Predicting Flour Milling Yield. Cereal Science Today 5:71-72,75 (1960).

The International Sawfly Nursery, Special Uniform Nursery and the International Spring Wheat Yield Nursery samples were milled on a Brabender Quadrumat Jr. mill. The mill was equipped with a #18 wire on the drum sieve. The throughs of the #18 wire were rebolted on a Strand sifter equipped with a #60 Tyler sieve. The sample was sifted for 1 minute. The throughs of the #60 wire were classified as flour, and this was the material tested. The overs of the #18 wire were classified as bran, and the overs of the #60 Tyler sieve as crude shorts.

The Uniform Regional Nursery blends and the Field Plot Nursery samples were milled on a Buhler continuous experimental mill. This mill has been slightly modified to give results more comparable to commercial milling. The break scalping sieves were clothed with #54 stainless steel wire, the reduction scalping sieves with #58, #66 and #105 stainless steel wire for the first, second and third reduction, respectively. All of the flour sieves were clothed with #135 stainless steel wire.

All six flour streams were combined to give the patent flour. The extraction of a good milling wheat using this flow is approximately 68%. This is comparable to a commercial "long patent" extraction flour. At this flour extraction of the wheat, the changes in flour ash are most sensitive to changes in percent extraction.

Protein Content - The protein was calculated by multiplying the factor of 5.7 times the percent nitrogen as determined by the standard Kjeldahl procedure.

Mineral Content or Ash Content - This was determined by measuring the residue of the minerals left after incinerating the sample for approximately 16 hours at 565°C. The results were reported as percentage of the sample that was incinerated.

Mixogram - The mixogram was determined by using 30 g of flour and adding 20 cc of water. The sensitivity spring setting was set at 10. All mixograms were run with constant weight of flour and volume of water. Absorptions reported were adjusted according to the height of the mixogram. The correction factor was determined from a series of flours by varying the amount of absorption.

Mixogram Pattern - The reference mixogram patterns given at the end of the report demonstrate the different types of mixograms that were obtained. A single number is assigned each pattern to characterize and simplify the classification of the curves--the larger number indicating stronger curve characteristics.

Baking Procedure or Formula - The baking formula used was as follows:

100% flour	3% milk D.S.M.
2% salt	3% yeast
5% sugar	2% shortening (Crisco, melted)

The samples were mixed to development in National Manufacturing mixers: the macro mixer for the 25 g samples and the 100 g special mixer for the 100 g samples. Bromate (7.5 ppm) for oxidation and barley malt flour (0.1%) for enzymatic supplement were added to each sample. All doughs were moulded in a Roll-Er-Up moulder.

Absorption - The amount of water, expressed as percent of the flour, required to bring the dough to proper consistency.

Crumb Color - A value was determined by comparing the loaf of the tested sample against a baking standard. This standard was selected as an average for the crop year for the spring wheat area.

Loaf Volume - The volume of the baked loaf as determined by seed displacement.

All values (protein, ash and absorption) were reported on a 14% moisture basis.

DISCUSSION

The following discussion presents some of the basic techniques and criteria used in the milling and baking quality evaluation of the samples. There are four major evaluation categories used: kernel characteristics, to characterize the kernel; milling performance, to evaluate the general milling characteristics; mixogram patterns, to classify the flour as to type; and baking evaluation, to rate the flour as to overall baking.

Each evaluation category can be important. A sample could be of a sufficiently poor quality for a given category to suggest elimination from future testing. However, a sample submitted for the first time and found to be questionable should be tested again to establish if it has a satisfactory or unsatisfactory classification. A sample which is consistently rated as questionable should be discarded.

Six characteristics (test weight, 1000 kernel weight, percent large kernels, percent small kernels, wheat mineral and wheat protein) were independent variables used to calculate the dependent variable - Kernel Characteristics. Four characteristics (percent extraction, mineral @65% extraction, milling characteristic, and protein difference between flour and wheat protein) were used to calculate the dependent variable - Milling Performance. Bake absorption, mixing time, dough characteristics, crumb color, crumb grain and loaf volume were the six independent variables used to determine the dependent variable - Baking Evaluation. These three dependent variables after calculation become independent variables used to calculate the dependent variable - General Evaluation.

The three dependent variables, Kernel Characteristics, Milling Performance and Baking Evaluation are rated on a scale of 1 to 8, with 1 being Very Satisfactory and 8 being Unsatisfactory. The General Evaluation is rated on a scale of 1 to 4, with 1 being no promise; 2, little promise; 3, some promise; and 4, good promise. If one of the independent variable's converted value is 8 (with the exception of crumb color), this automatically will rate the General Evaluation as 1, or no promise. If there are no 8's, the three values are employed in a regression equation to derive the General Evaluation. The weighted value for each of these variables on the General Evaluation is approximately 6% for Kernel Characteristics, 47% for Milling Performance and 47% for Baking Evaluation.

To quickly point out problem areas for a selection, two additional columns appear on the printout. One column is Minor Deficiencies in which the independent variables, converted to a 5 or a 6 (i.e., Questionable or Questionable to Unsatisfactory) will appear. The second column is Major Deficiencies in which the independent variables were converted either to a 7 or an 8 (i.e. Unsatisfactory to Questionable and Unsatisfactory). Deficiencies of the various selections may be readily determined by scanning these columns. It is also possible to have one or two independent variables that would appear in the major deficiency column, rating 7. These characteristics should be given serious consideration even though they do not influence the general rating sufficiently to rank the selection as having no promise.

All samples, as in previous years, are compared with a milling and baking standard that represents a blend of the crop year blended to a known quality. However, the samples for the individual stations are evaluated against the average results of the check varieties from the respective stations. The agronomic and climatic conditions of the individual locations can affect the quality of the wheat sample, such that the evaluation at certain locations could have all samples--even the named varieties--classified as Questionable to Unsatisfactory. Therefore, the evaluation ratings of one station are not directly comparable with those of another station. For example, an area may produce low protein wheats which give large and plump kernels, good milling and kernel characteristics, but low protein and unsatisfactory baking properties such as short mixing time, low loaf volume and weak dough characteristics. The wheat from this area could not be considered as a strong spring wheat and would not maintain the quality expected from the spring wheat producing area. A good variety should have tolerance to a wide range of environmental conditions and the overall picture should be taken into consideration for establishing these varieties.

Kernel Characteristics are important in determining the initial value of the wheat and, if extremely poor, could disqualify a new variety from further consideration. Because of the present grading system, it is desirable to have a good test weight. If a sample has a low 1000 kernel weight and small kernel size distribution, it would be considered a poor sample for milling because of the high ratio of bran to endosperm. Therefore, it is desirable to have plump kernels. Wheat ash is an important factor when comparing a variety against other standard varieties. If a sample consistently has higher wheat mineral content, it increases the probability of having high flour ash. Lower

protein than the standard varieties is not desirable, because in a low protein crop year the probability of it having such a low protein as to be undesirable is much greater. Therefore, the protein must also be considered as a characteristic when comparing varieties grown in the same locality.

Milling Performance is very important, especially the subcategory of milling characteristics. If low extraction or high flour ash is obtained, these become major factors which are quite unacceptable from a commercial milling standpoint. All flour mineral contents are reported at a constant extraction of 65%, so that the figures are directly comparable. As a rule of thumb, one can approximate that each point of ash (0.01%) is equivalent to approximately 2% in extraction.

Milling characteristics are important. A sample which tends to be soft in character requires a different milling technique to be milled properly. On commercial mills flowed for hard vitreous spring wheats, soft milling characteristics cause great difficulty. Therefore, if a sample shows softness in character, it is considered to be unsatisfactory. Likewise, a sample which is extremely hard and vitreous will cause difficulty. Both types of wheat (soft and vitreous) require different roll pressures, clothing, sifter surface and temper to be milled properly. If these wheats are blended with normal milling wheats, improper results are obtained since these characteristics are not necessarily compatible or additive. Normal to soft score indicates that the sample shows a tendency toward softness of character on the flour mill stocks and extraction. This would indicate that the sample may give some difficulty for certain mill streams, and an adjustment would either have to be made in the milling flow or in tempering procedures to compensate for these differences. The properties of this wheat may or may not be compatible with other wheats with which it may be blended; therefore, it is important to maintain varieties with milling characteristics as uniform as possible.

The amount of protein recovered in the flour for a sample is of importance. High protein wheats yielding low protein flours are not desirable. Such a wheat would have much of the protein distributed in the outer portion of the kernel which would result in excessive protein in the feed. Therefore, higher wheat protein would be necessary to yield a flour with protein content comparable to that of a wheat that gives good flour protein recovery.

Mixogram Patterns and Farinogram Patterns are important in estimating the strength and mixing tolerance or potential mixing tolerance of a flour. A long, flat curve is more desirable that a short, peaked curve; however, an extremely long curve may be undesirable, if the flour would require excessive mixing for proper development. Both the pattern and length of the curve are important, and both must be considered. Abnormal curves, such as sway-back or long initial time to incorporate the water, indicate undesirable characteristics.

Baking Evaluation takes into account the flour absorption, mixing time, dough characteristics, loaf volume and machinability. A sample which has low absorption would be unsatisfactory. A sample with extremely short mixing time would also be considered undesirable as a good strong spring wheat. When a sample is in the minimal range for these values, it is considered to be questionable until further testing demonstrates whether a definite deficiency exists.

Doughs having mellow to weak dough properties show a tendency towards weakness. Also, for mellow to strong, the dough is mellow but has a tendency to be strong, and a strong to mellow dough is just the reverse. Since these characteristics are subjective rather than objective, it is necessary at times to estimate the tendency; therefore, the necessity exists for apparent double grades.

The grain or appearance of the interior of the loaf shows how well the sample stood up during baking and may point out or explain some deficiencies which have been observed during the baking test.

Loaf volume indicates potential strength of the flour in a different manner than mixing time or dough characteristics in that it shows the ability or lack thereof for the dough to expand under pressure and to contain the entrapped gases during this expansion. Weak flours act much like rotten balloons, which burst when blown up and collapse and yield low loaf volume or extremely large volume and large holes in the interior of the loaf. Low protein flours and lifeless (dead) doughs exhibit properties similar to putty and do not expand during fermentation or baking and give low loaf volume. Tough and very bucky doughs are bound too tightly and impede expansion of the gases causing low loaf volume.

General Evaluation rating applies only to the data contained in the year of the report. A new category, the Prospect of a selection, will apply to two or more years of data. The Prospect is given for each selection that has been tested for at least two crop years. This evaluation

takes into account the various grading factors and the results of the crop years in an effort to determine if the selection should be considered as a prospective new variety. The main defects and outstanding features are discussed. A selection which is promising should be continued. Those which show some promise with outstanding agronomic characteristics should be seriously considered and looked at in large plots (if it has not been done previously), providing sufficient other information has been obtained. A sample which shows little or no promise should be discontinued.

UNIFORM REGIONAL NURSERY SAMPLES - 1980 CROP

Discussion of Area Blends

A total of 572 Uniform Regional Nursery samples were received. The samples were from 19 stations in eight states. Wheat blends were made of the samples for this crop year by area. The areas tend to represent movement of the wheat in the market. Kernel characteristics were determined on individual samples to eliminate possible erroneous results. The area blends were then milled and baked by our macro method. Thirty samples were received from each of the 19 stations. Twenty-five selections were included for quality evaluation in the Uniform Regional Nursery samples. The remainder of the samples were commercially named varieties, namely, Butte, Chris, Era, Marquis and Waldron.

Data from the northeast area blend are given in Table 1. The four stations included in this blend were Carrington, Langdon and Minot, North Dakota and Crookston, Minnesota.

The data for the southeast area blend are given in Table 2. The five stations included in this blend were: Morris and St. Paul, Minnesota; Brookings, Redfield and Selby, South Dakota. Madison, Wisconsin was not included in the area blend because it showed sprout damage; however, the station was milled and baked separately, and the data is reported later in Table 7.

The data for the western area blend are given in Table 3. The seven stations included in this blend were: Aberdeen, Idaho; Havre and Sidney, Montana; Dickinson and Williston, North Dakota; and Sheridan and Torrington, Wyoming. Tetonia, Idaho and Pullman, Washington were not included in the area blend because samples from Tetonia showed frost damage, and the samples from Pullman were not compatible (low protein) with the other samples from that area. Samples from these two stations were processed individually, and the data are reported in Tables 5 (Tetonia) and 6 (Pullman).

Discussion of Area and Crop Year Averages

In Table 4 are given the average area results for the combined data of the varieties, Butte, Chris, Era and Waldron samples submitted from the six states and sixteen stations. The area average represents all samples that were grown in that area for the year cited.

The milling and baking results were obtained from the area blend of the wheats in equal proportions from each of the stations for the respective variety or selection. The regular 100 g straight dough rich formula baking procedure was used in baking. The General Evaluation column includes the overall performance of the blend of each sample. The General Evaluation given for the sample area blend may not agree with that of the individual wheat samples within the blend, since averages do not express the range, and poor characteristics may be masked. In an endeavor to clarify this problem, the average general evaluation, the number of total deficiencies and the number of major deficiencies are shown in parenthesis after each variety or selection -- (Average General Evaluation - #Total Deficiencies/#Major Deficiencies).

For simplicity and brevity of the report, as in previous reports, each selection or variety will be discussed from the general viewpoint rather than the individual areas. General Evaluation summarizes the results from the individual areas for one crop year. The evaluation is more meaningful for the overall performance of a variety or selection, when at least two or more crop years are included. Data discussed under the category, The Prospect, includes two or more years.

Also given in Table 4 are comparisons of the previous four crop years, which include all selections grown in the Uniform Regional Nursery for that year, as well as the 4-YA. The 1980 crop kernel characteristics (test weight, 1000 kernel weight and wheat protein) were similar to the 4-YA. Milling extraction was down slightly from the 4-YA; however, flour protein was 0.3% better than the 4-YA. Bake absorption was 1.6% higher and mixing time one-half minute longer than the 4-YA. Dough characteristics were slightly stronger and crumb color, crumb grain and loaf volume were similar to the 4-YA.

A comparison of the 1980 and 1979 crop results showed the 1980 crop to be slightly better. In general, the kernel characteristics (1000 kernel weight and test weight) were similar, with wheat protein 0.7% higher than the 1979 crop. Milling was quite similar to the 1979 crop; however, flour protein was 1.0% better than the 1979 crop. The 1980 baking absorption was 2.4% higher than in 1979 with one-half minute longer mixing time and a dough similar to the 1979 crop. Crumb color, crumb grain and loaf volume were also similar to the 1979 crop.

Discussion of Individual Varieties or Selections

Average results of the varieties Butte, Chris and Waldron for each of the individual areas were used as standards for the other selections from that area; therefore, a variety or selection may be rated satisfactory in two different areas, but comparison of the data may show much poorer results for one area due to adverse environmental conditions. Thus the sample with poor results could be rated as having unsatisfactory quality when compared with the overall spring wheat area, even though it may be rated as showing good promise for one area.

By using the same format as used in previous years and employment of the computer, all named varieties receive a general evaluation. Only those varieties in the "Good Promise" category could be consistently considered as acceptable to the trade both in the domestic, as well as foreign markets. Data for the named varieties of Butte, Chris, Era, Marquis and Waldron will be an average of each variety for the last three years.

Butte	(3.7 - 6/2)*	- Good Promise
Chris	(3.9 - 13/0)	- Good Promise
Era	(1.7 - 29/15)	- Little Promise
Marquis	(2.2 - 24/6)	- Little Promise
Waldron	(3.5 - 6/1)	- Good Promise

HS 7664

Kernel Characteristics - Questionable to Unsatisfactory. Tendency toward low protein and test weight.

Milling Performance - Satisfactory to Questionable. Tendency toward high flour mineral content at 65% extraction.

Baking Evaluation - Unsatisfactory. Long mix time and low absorption.

General Evaluation - Based on this year's crop results, this selection shows no promise due to low protein and low bake absorption.

HS 74183 (2.0 - 33/10)

Kernel Characteristics - Questionable to Unsatisfactory. Low protein content and a tendency toward a small percentage of large kernels.

* (Average General Evaluation - #Total Deficiencies/Major Deficiencies.)

HS 74183 (Cont'd)

Milling Performance - Satisfactory.

Baking Evaluation - Questionable. May have a tendency toward low absorption and a tough dough.

General Evaluation - Based on this year's crop results, this selection shows little promise, mainly because of its questionable kernel characteristics.

The Prospect - Based on three crop years, this selection shows little promise, due to questionable kernel characteristics.

ID 0167

Kernel Characteristics - Questionable. Low protein content and a tendency toward high percentage of small kernels.

Milling Performance - Satisfactory.

Baking Evaluation - Unsatisfactory. Long mix time and a tendency toward a very strong dough.

General Evaluation - Based on this year's crop results, this selection would show no promise, due to its tendency for a high percentage of small kernels, long mix time and tough dough.

MN 7222 (2.1 - 25/9)

Kernel Characteristics - Questionable to Unsatisfactory. Tendency toward low protein content.

Milling Performance - Satisfactory.

Baking Evaluation - Questionable to Unsatisfactory. Low absorption.

General Evaluation - This selection based on this year's crop would show little promise, because of low protein and bake absorption.

The Prospect - Based on the last three crop years, this selection would show little promise as a new variety, due to its tendency toward low protein and bake absorption.

MN 7357

Kernel Characteristics - Questionable. Tendency toward low protein content.

MN 7357 (Cont'd)

Milling Performance - Satisfactory to Questionable. May have a tendency toward high flour mineral content at 65% extraction.

Baking Evaluation - Questionable. Has tendency toward a tough dough and long mix time.

General Evaluation - Based on this year's crop results, this selection would show some promise, although it has a tendency for minimum protein content and high flour mineral content at 65% extraction.

MN 70170R

Kerne_ Characteristics - Questionable. Tendency toward low 1000 kernel weight and percentage of large kernels.

Milling Performance - Satisfactory.

Baking Evaluation - Questionable to Unsatisfactory. Low absorption.

General Evaluation - Based on this year's crop results, this selection shows little promise, due to its tendency toward poor kernel characteristics and low absorption.

MN 73168 (1.7 - 22/6)

Kernel Characteristics - Questionable. Tendency toward low test weight and protein content.

Milling Performance - Questionable. High mineral content at 65% extraction.

Baking Evaluation - Questionable to Unsatisfactory. Very strong dough and a tendency toward low absorption.

General Evaluation - Based on this year's crop results, this selection shows little promise, because of its tendency toward low test weight, high mineral content at 65% extraction and a very strong dough.

The Prospect - Based on two crop years' results, this selection would show little promise, due to low protein, a tendency toward high mineral content at 65% extraction, low absorption and a very strong dough.

MT 7648 (1.8 - 29/5)

Kernel Characteristics - Questionable. Tendency toward a high percentage of small kernels.

Milling Performance - Questionable to Satisfactory. Has a tendency for high mineral content at 65% extraction.

Baking Evaluation - Questionable to Satisfactory. Long mix time.

General Evaluation - This selection based on this year's crop shows some promise; however, it does have a tendency toward poor kernel characteristics and a long mix time.

The Prospect - Based on two crop years' results, this selection would show little promise as a new variety, due to poor kernel characteristics and erratic baking performance.

MT 7836

Kernel Characteristics - Questionable to Satisfactory. Tendency toward high wheat mineral and low protein.

Milling Performance - Satisfactory to Questionable. May have a tendency toward high mineral content at 65% extraction.

Baking Evaluation - Questionable. Erratic baking performance. Tendency toward long mix time.

General Evaluation - Based on this year's crop results, this selection shows little promise, because of its erratic baking performance.

ND 569 (3.7 - 4/0)

Kernel Characteristics - Questionable to Satisfactory. Tendency toward low protein.

Milling Performance - Satisfactory.

Baking Evaluation - Satisfactory to Questionable. Tendency toward a very strong dough.

General Evaluation - This selection based on this year's crop results would show good promise as a new variety.

The Prospect - Based on two crop years, this selection would show good promise as a new variety.

ND 572

Kernel Characteristics - Satisfactory.

Milling Performance - Questionable to Satisfactory. Tendency toward low flour extraction.

Baking Evaluation - Satisfactory to Questionable. Absorption and crumb grain down slightly.

General Evaluation - This selection based on this year's results would show some promise. It does have a tendency toward low flour extraction.

ND 573

Kernel Characteristics - Satisfactory to Questionable. Slightly lower protein than checks.

Milling Performance - Satisfactory to Questionable. Flour extraction down slightly and a tendency toward high mineral content at 65% extraction.

Baking Evaluation - Satisfactory to Questionable. Tendency toward a very strong dough.

General Evaluation - Based on this year's crop results, this selection would show some promise as a new variety. Kernel characteristics, milling and baking performance are slightly down from the checks.

ND 574

Kernel Characteristics - Satisfactory to Questionable. Test weight slightly less than checks.

Milling Performance - Questionable to Satisfactory. Tendency toward high mineral content at 65% extraction.

Baking Evaluation - Satisfactory to Questionable. Crumb grain slightly poorer than the checks.

General Evaluation - Based on this year's crop results, this selection would show some promise, although it does have a tendency toward high mineral content at 65% extraction.

ND 575

Kernel Characteristics - Satisfactory to Questionable. Tendency toward low test weight and protein content.

ND 575 (Cont'd)

Milling Performance - Questionable to Satisfactory. Tendency toward high mineral content at 65% extraction.

Baking Evaluation - Satisfactory.

General Evaluation - This selection based on this year's data would show some promise; however, it does show a tendency toward high mineral content at 65% extraction.

NK 75S2631

Kernel Characteristics - Questionable to Satisfactory. Tendency toward low protein content.

Milling Performance - Unsatisfactory. High mineral content at 65% extraction.

Baking Evaluation - Questionable to Unsatisfactory. Tendency toward low absorption.

General Evaluation - Based on this year's crop results, this selection would show no promise as a new variety, due to high mineral content at 65% extraction, its tendency toward low protein content and low absorption.

NK 75S2634

Kernel Characteristics - Questionable. Tendency toward low protein content.

Milling Performance - Satisfactory to Questionable. Tendency toward high mineral content at 65% extraction.

Baking Evaluation - Unsatisfactory to Questionable. Low absorption.

General Evaluation - This selection based on this year's crop results would show little promise, due to low protein content and low bake absorption.

RL 4352

Kernel Characteristics - Satisfactory to Questionable. Test weight slightly less than checks.

Milling Performance - Questionable. High mineral content at 65% extraction.

RL 4352 (Cont'd)

Baking Evaluation - Satisfactory to Questionable. Absorption slightly less than checks.

General Evaluation - Based on this year's crop results, this selection would show little promise, due to high mineral content at 65% extraction.

SD 2700

Kernel Characteristics - Satisfactory to Questionable. Tendency toward low protein content.

Milling Performance - Unsatisfactory. High mineral content at 65% extraction and a tendency toward low flour extraction.

Baking Evaluation - Questionable. Long mix time.

General Evaluation - Based on this year's crop results, this selection would show no promise as a new variety, due to high mineral content at 65% extraction and long mix time.

SD 2835

Kernel Characteristics - Satisfactory to Questionable. Tendency toward low protein content.

Milling Performance - Satisfactory to Questionable. Flour extraction slightly less than checks.

Baking Evaluation - Satisfactory to Questionable. Crumb grain slightly less than checks.

General Evaluation - This selection based on this year's crop results would show some promise as a new variety; however, it does show a tendency toward less protein content than the checks.

SD 2868

Kernel Characteristics - Satisfactory to Questionable. Tendency toward a small percentage of large kernels.

Milling Performance - Satisfactory.

Baking Evaluation - Satisfactory to Questionable. Tendency toward a weak dough.

SD 2868 (Cont'd)

General Evaluation - Based on this year's crop results, this selection would show some promise. The baking quality was slightly less than the checks.

SD 2870

Kernel Characteristics - Satisfactory to Questionable. Tendency toward small percentage of large kernels.

Milling Performance - Questionable. Tendency toward high mineral content at 65% extraction and slightly lower flour extraction.

Baking Evaluation - Questionable. Tendency toward a weak dough.

General Evaluation - This selection based on this year's crop data would show little promise as a new variety, due to its questionable milling and baking performance.

WA 6756

Kernel Characteristics - Questionable to Unsatisfactory. Tendency toward low test weight and protein content.

Milling Performance - Questionable to Unsatisfactory. High mineral content at 65% extraction.

Baking Evaluation - Questionable to Unsatisfactory. Tendency toward long mix time and low absorption.

General Evaluation - Based on this crop year's results, this selection would show no promise, because of its tendency toward low protein content, high mineral content at 65% extraction and long mix time.

WA 6758

Kernel Characteristics - Unsatisfactory to Questionable. Small percentage of large kernels and a tendency toward low test weight.

Milling Performance - Satisfactory.

Baking Evaluation - Unsatisfactory. Low absorption.

General Evaluation - Based on this year's crop results, the selection would show no promise as a new variety, due to its small percentage of large kernels and unsatisfactory baking evaluation.

X 6718

Kernel Characteristics - Questionable. Tendency toward low protein content.

Milling Performance - Satisfactory to Questionable. Tendency toward low protein content and test weight.

Baking Evaluation - Unsatisfactory to Questionable. Very strong dough and a tendency toward long mix time.

General Evaluation - Based on this year's crop results, this selection would show little promise, due to long mix time and a tendency toward a very strong dough.

X 6753

Kernel Characteristics - Unsatisfactory to Questionable. Tendency toward a small percentage of large kernels, low kernel weight and low protein content.

Milling Performance - Satisfactory.

Baking Evaluation - Unsatisfactory to Questionable. Tendency toward low bake absorption.

General Evaluation - This selection would show little promise as a new variety based on this year's crop results, due to its tendency toward low protein content and low bake absorption.

1980 UNIFORM REGIONAL HARD RED SPRING WHEAT NURSERY SAMPLES NOT INCLUDED IN THE AREA BLENDS

These samples were milled on the Brabender Quadrumat Jr. Mill, and a 25 gram flour sample was baked. Butte, Chris and Waldron were the standards.

TETONIA, IDAHO SAMPLES

The effect of frost on these samples was evident in the kernel appearance, when looking at the data and in the general evaluation. Test weights in most cases were low and wheat ash showed a tendency to be high. Flour extraction and mineral at 65 percent extraction were severely affected. Flour extraction was very low, and the mineral content at 65 percent extraction was high. The frost had a definite affect on the bake evaluation. All samples showed a weak to dead dough, crumb color was down and crumb grain and loaf volume were severely affected. Data for these samples are given in Table 5.

PULLMAN, WASHINGTON SAMPLES

Several selections from this station showed good promise. However, one must consider that the standards used were comparatively grown, and that the wheat and flour protein levels were considerably lower than desired. This gives a somewhat fictitious general evaluation to the samples. Data for these samples are given in Table 6.

MADISON, WISCONSIN SAMPLES

Several selections from this station also showed good promise. But again, the standards used were comparatively grown and test weight, wheat and flour protein, bake absorption, dough character and loaf volume were severely affected by sprout damage and would not produce an acceptable product. Data for these samples are given in Table 7.

WILLISTON, NORTH DAKOTA SAMPLES

The 1980 milling and baking standard was used as the standard. Coteau showed no promise, due to its poor kernel characteristics. Data for these samples are given in Table 7.

FIELD PLOT NURSERY SAMPLES - 1980 CROP

Thirty-one samples were received from two states and two stations. The data for the individual samples are given in Tables 8 and 9.

NORTH DAKOTA SAMPLES

Twenty-four samples were received from the Williston station. Sixteen of the samples were named varieties which have been released. The data are given in Table 8. Butte, Olaf and Waldron were used as standards.

ARIZONA SAMPLES

Seven samples were received from the Mesa station. Two of the samples were named varieties which have been released. Cajeme 171 was used as the standard. Data for these samples are given in Table 9.

INTERNATIONAL SAWFLY NURSERY SAMPLES - 1980 CROP

Fifty-eight samples were received from two stations in Montana and two stations in North Dakota. Twelve samples were received from each of these stations: Bozeman and Havre, Montana; and Minot and Williston, North Dakota. Six of these samples were the named varieties - Chris, Fortuna, Lew, Thatcher, Tioga and Waldron. Six of the samples were the selections MT 783, MT 7620, MT 7810, MT 7819, MT 7926 and ND 580. The Minot, North Dakota station also included MT 810 and SU 28 SIB-1. The Williston station included Butte, Olaf, MT 781 and SU 28's 1107. Bozeman and Havre, Montana stations included MT 781 and SU 281. Sample quality data from the individual stations are given in Tables 10 through 13. Table 14 contains averages of these data. Again, averages and blends may not reflect the range of response of a selection or variety to environmental conditions; therefore, averages of the general evaluation, numbers of total deficiencies, and the number of major deficiencies are given, the same as they were for the Uniform Regional Nursery series. The varieties Fortuna, Thatcher and Tioga grown at each station were used as the standards.

Chris	(3.7 - 28/5)*	- Good Promise
Fortuna	(3.7 - 3/1)	- Good Promise
Lew	(2.5 - 29/4)	- Some Promise
Thatcher	(2.8 - 38/8)	- Some Promise
Tioga	(3.9 - 2/0)	- Good Promise
Waldron	(3.5 - 12/0)	- Good Promise

MT 783 (2.4 - 34/6)

Kernel Characteristics - Questionable to Satisfactory. Low percentage of large kernels and tendency toward low kernel weight.

Milling Performance - Satisfactory to Questionable. Tendency toward high mineral content at 65 percent flour extraction.

Baking Evaluation - Questionable to Satisfactory. Long mix time.

General Evaluation - This selection based on this year's crop results would show little promise, due to poor kernel characteristics and long mix time.

* (Average General Evaluation - #Total Deficiencies/#Major Deficiencies.)

MT 783 (Cont'd)

The Prospect - Based on two crop years' results, this selection would show little promise as a new variety, due to poor kernel characteristics and its tendency toward long mixing time.

MT 7620 (1.8 - 45/13)

Kernel Characteristics - Questionable. Low percentage of large kernels and 1000 kernel weight.

Milling Performance - Questionable to Satisfactory. Low flour extraction.

Baking Evaluation - Questionable to Satisfactory. Tendency toward long mix time and poor crumb grain.

General Evaluation - This selection based on this year's crop results would show some promise. Its kernel characteristics are questionable, and the milling performance is down.

The Prospect - Based on two crop years' results, this selection would show little promise as a new variety, due to poor kernel characteristics and milling performance.

MT 7810 (1.4 - 40/21)

Kernel Characteristics - Questionable to Unsatisfactory. Tendency toward low 1000 kernel weight and percentage of large kernels.

Milling Performance - Questionable to Satisfactory. High mineral content at 65 percent flour extraction.

Baking Evaluation - Satisfactory to Questionable. Tendency toward long mixing time.

General Evaluation - This selection based on this year's crop results would show little promise, due to its poor kernel characteristics and milling performance.

The Prospect - This selection based on two crop years' results shows no promise as a new variety, due to low percentage of large kernels, 1000 kernel weight, high mineral content at 65 percent flour extraction and tendency toward long mix time.

MT 7819

Kernel Characteristics - Questionable. Tendency toward low percentage of large kernels.

Milling Performance - Satisfactory to Questionable. Has a tendency for high mineral content at 65 percent flour extraction.

Baking Evaluation - Unsatisfactory. Low bake absorption and a very long mix time.

General Evaluation - This selection would show no promise based on this year's data, due to low bake absorption, long mix time and questionable kernel characteristics.

MT 7926

Kernel Characteristics - Questionable to Unsatisfactory. Tendency toward low percentage of large kernels, 1000 kernel weight and wheat protein.

Milling Performance - Satisfactory.

Baking Evaluation - Questionable. Tendency for low bake absorption and erratic dough characteristics.

General Evaluation - Based on this year's crop results, this selection would show little promise, due to low bake absorption and questionable kernel characteristics.

ND 580

Kernel Characteristics - Satisfactory.

Milling Performance - Satisfactory.

Baking Evaluation - Satisfactory to Questionable. Somewhat erratic results.

General Evaluation - Based on this year's crop results, this selection would show good promise.

INTERNATIONAL NURSERY - 1980 CROP

Sixteen samples were received from St. Paul, Minnesota. Era was used as the standard. Two selections, MN 7086 and Q.T. 4081 showed good promise; however, Q.T. 4081 was 2.2% lower in flour protein than MN 7086. Major faulting factors were low flour extraction, bake absorption, loaf volume and protein content. Data are presented in Table 15.

EXPLANATION OF ABBREVIATIONS LISTED UNDER THE HEADINGS AND THOSE THAT MAY BE LISTED UNDER MINOR AND MAJOR DEFICIENCIES ON COMPUTER PRINTOUT

TW = Test Weight
KW = 1000 Kernel Weight
LG = Large Kernels
MD = Medium Kernels
SM = Small Kernels

WM = Wheat Mineral
WP = Wheat Protein
KERN CHAR = Kernel Characteristics
EX = Flour Extraction
M65 = Mineral at 65% Flour Extraction

FLR. PRO = Flour Protein
PD = Protein Drop Between Flour and Wheat
MLG. CHAR = Milling Characteristics
MLG. PER = Milling Performance
MIX. ABS = Mixograph Absorption

MIX. PAT = Mixograph Pattern Score
BAKE. ABS. = Actual Bake Absorption
BA = Bake Absorption
MIX TIME = Actual Dough Mixing Requirements
MT = Mix Time

DOUGH CHAR = Dough Handling Characteristics
DO = Dough Characteristics
CRUMB COLOR = Example - 100.5
100 = score received for color
.5 = creamy-the characteristic of that particular loaf.

CRUMB GRAIN = Example - 86.05
86 = score received for crumb grain.
.05 = open-or characteristic of that loaf's crumb grain.

LOAF VOL = Actual Loaf Volume
LV = Loaf Volume
BAKE EVAL = Bake Evaluation
GEN. EVAL = General Evaluation

TABLE 1

QUALITY DATA OF UNIFORM REGIONAL NURSERY BLENDS

1983 CROP

VARIETY OR SEL. NO.	T.W. 1/ g/100;	1000 WT. g.	KERNEL SIZE 18 64n 54 %			WHT. MIN. %	AMT. PRO. %	KERN. CHAR. 3%	FLR. EXT. %	MIN.B ASH%	FLO. PRO. %	MIG CHAR. 5%	MLG. %	MIX. %	MIX. TIME	BAKE ABS. %	MIX TIME	DOUGH CHAR. %	CRUMB COLOR %	CRUMB GRAIN %	L3AF VOL. %	BAKE EVAL. %	GEN. EVAL. %	MINOR DEFICIENCY	MAJOR DEFICIENCY
NORTHEASTERN REGION																									
SUPER	61.6	32.9	43	56	1	1.55	14.7	2	71.7	0.34	13.9	1	2	66.5	6	59.7	3:23	3	100.0	87.97	595	2	4		
CHRIS	60.0	29.3	87	12	1	1.58	15.1	3	73.2	0.35	14.0	1	2	66.5	6	59.2	3:25	3	100.0	88.03	925	2	4	KK LG	
594	61.3	31.6	82	17	1	1.56	13.5	5	72.3	0.37	12.9	1	3	51.2	5	65.1	4:07	3	101.2	89.99	945	0	1	MA5	
MARQUIS	53.3	33.4	37	62	1	1.62	14.6	4	69.3	0.39	14.2	1	5	67.6	5	53.5	4:13	3	101.0	88.09	975	2	3	MA5	
KALDRUN	59.4	34.0	57	42	1	1.69	15.6	2	70.2	0.37	14.5	1	3	67.9	6	65.9	4:25	3	100.0	86.05	973	2	4	MA5	
MS 7664	59.5	35.1	60	39	1	1.61	13.6	5	71.4	0.36	13.3	1	3	64.2	7	59.1	6:01	3	110.0	87.09	895	0	1		WP BA
49 74103	59.1	34.7	31	55	1	1.55	13.9	6	70.9	0.35	13.7	1	2	65.0	6	66.2	5:00	3	111.7	86.03	905	0	1	WP	BA
13 0167	59.5	32.9	30	67	3	1.59	13.0	8	71.1	0.37	12.5	1	3	63.5	8	64.7	8:00	3	101.0	85.05	950	0	1	SW MA5 MT	XP BA
MN 7222	59.3	31.1	55	55	1	1.65	13.7	5	72.2	0.37	13.1	1	3	64.2	5	53.5	8:13	3	111.0	87.05	950	0	1	MA5	MT BA
MN 7357	59.6	35.5	60	39	1	1.65	14.9	5	72.5	0.37	13.9	1	3	67.0	7	68.0	6:00	2	111.0	88.09	915	0	3	WP MA5 30	
MN 78170 R	61.0	32.5	46	53	1	1.59	14.0	5	72.4	0.36	13.5	1	1	63.5	4	59.5	3:50	3	110.0	87.05	925	0	1	WP	BA
MN 73168	58.5	35.1	55	43	1	1.65	13.9	5	71.2	0.37	13.4	1	3	65.7	7	55.5	5:03	2	100.0	89.99	950	7	2	WP MA5 DO	BA
MT 7615	58.1	33.2	35	63	2	1.74	14.5	5	69.9	0.37	14.2	1	3	69.1	10	70.3	8:00	3	103.0	86.07	970	5	2	SW WW MA5 MT 30	
MT 7533	57.5	36.9	49	50	1	1.78	14.8	3	70.4	0.38	14.6	1	4	75.7	13	73.7	5:75	5	113.9	87.07	1325	0	1	WW MA5	BA DO
MT 569	59.6	17.9	72	27	1	1.63	14.6	4	79.3	0.33	13.8	1	2	69.4	7	71.3	4:75	3	101.5	85.05	765	2	4		
ND 572	61.0	35.0	57	42	1	1.67	15.0	2	67.7	0.37	14.3	1	5	67.3	7	67.1	4:25	3	111.0	85.10	920	4	2	EX MA5 BA	
ND 573	61.5	32.7	48	51	1	1.62	15.1	2	69.5	0.35	14.3	1	3	66.5	7	53.0	4:03	3	111.0	89.93	925	2	4		
ND 574	59.6	37.9	72	27	1	1.66	15.7	2	59.5	0.37	14.9	1	4	67.9	6	68.3	3:25	3	110.0	89.78	950	2	3	MA5	
ND 575	60.5	36.7	66	33	1	1.63	14.7	2	69.3	0.37	14.4	1	4	67.9	6	68.2	4:00	3	101.0	87.07	950	2	3	MA5	
WX 755 2638	60.5	34.3	59	40	1	1.61	14.7	4	70.4	0.40	13.9	1	4	66.3	5	55.5	5:25	3	111.0	90.09	925	5	1	WP	MA5 BA
WX 755 2639	63.4	31.7	47	52	1	1.60	13.6	5	71.4	0.37	13.1	1	5	65.2	5	64.0	4:00	3	101.0	91.99	970	0	1		WP MA5 BA
SL 4352	60.5	33.9	57	42	1	1.60	15.3	2	71.0	0.38	14.5	1	4	65.2	6	65.7	3:59	3	111.7	88.09	960	2	3	MA5	
SJ 2733	60.1	35.9	61	35	1	1.50	14.6	3	67.7	0.43	13.5	1	8	65.7	8	66.1	7:25	5	131.0	87.05	950	0	1	EX MT	MA5 BA
SJ 2635	60.3	34.2	54	45	1	1.63	14.5	3	69.5	0.35	14.3	1	3	67.6	8	59.1	6:03	3	101.0	87.09	930	2	4		
SD 2545	60.9	32.5	39	61	1	1.64	14.9	2	71.6	0.34	14.2	1	2	67.1	5	67.4	5:75	3	132.4	88.09	950	4	3	BA	
SJ 2070	58.5	30.0	31	68	1	1.65	15.5	3	69.3	2.33	14.9	1	3	67.3	6	69.8	3:25	3	131.0	89.99	920	2	4		
KA 5746	58.1	34.3	57	41	2	1.63	13.4	6	70.9	0.40	13.2	1	8	65.7	7	66.7	6:51	3	102.0	88.99	870	0	1	LG SW MT	WP MA5 BA
WA 8758	61.3	32.7	23	70	2	1.65	12.5	8	71.2	0.35	12.2	1	2	64.7	5	65.3	4:03	3	133.9	87.07	940	0	1	LG SM	XP BA
K 5715	59.0	34.8	38	62	2	1.68	14.5	5	70.3	0.37	13.8	1	3	63.1	9	57.8	8:00	2	131.7	82.05	960	6	2	SW MA5 MT DO	
K 5753	57.9	29.1	27	70	3	1.61	13.6	7	71.7	0.37	12.9	1	3	63.3	5	54.9	6:75	3	132.5	85.09	940	0	1	KW LG SM MA5	WP BA

1/ CLEAN DRY - SURFACE & 13.5% FOR DISCARGE-FREE T.W.

2/ 14% MOISTURE BASIS.

3/ 1 = VERY SATISFACTORY, 2 = SATISFACTORY, 3 = SATISFACTORY-QUESTIONABLE, 4 = QUESTIONABLE-SATISFACTORY, 5 = QUESTIONABLE, 6 = QUESTIONABLE-UNSATISFACTORY, 7 = UNSATISFACTORY-QUESTIONABLE, 8 = UNSATISFACTORY.

4/ 1 = NORMAL, 2 = NORMAL-SOFT, 3 = SOFT-NORMAL, 4 = SOFT, 5 = GRITTY, 6 = VERY SOFT.

5/ REFER TO REFERENCE WORKSHEETS FOR MATHEMATICAL CURVE PATTERN. (1 = VERY WEAK --- 11 = VERY STRONG

6/ 1 = BUCKY, 2 = VERY ELASTIC, 3 = ELASTIC, 4 = ELASTIC-PLIABLE, 5 = PLIABLE-ELASTIC, 6 = PLIABLE, 7 = PLIABLE-WEAK, 8 = WEAK-PLIABLE, 9 = WEAK, 10 = VERY WEAK, 20 = SLIGHTLY SEAL, 30 = DEAD.

7/ XXX.9 = BRIGHT WHITE, XXX.8 = WHITE, XXX.7 = SLIGHTLY CREAMY, XXX.6 = STRONG CREAMY, XXX.5 = CREAMY, XXX.4 = VERY CREAMY, XXX.3 = GRAY, XXX.2 = DULL GRAY, XXX.1 = VERY GRAY.

8/ XXX.03 = SOGGY, XXX.06 = THICK WALL OR HARSH, XXX.83 = CLOSED, XXX.35 = OPEN, IRREGULAR, XXX.05 = SLIGHTLY IRREGULAR, XXX.37 = IRREGULAR,OPEN, XXX.09 = OPEN, XXX.13 = IRREGULAR. XXX.30 = SLIGHTLY OPEN,IRREGULAR, XXX.50 = SLIGHTLY IRREGULAR,OPEN, XXX.73 = SLIGHTLY OPEN, XXX.99 = SLIGHTLY IRREGULAR, XXX.99 = NORMAL.

9/ 1 = NO PROMISE, 2 = LITTLE PROMISE, 3 = SOME PROMISE, 4 = GOOD PROMISE.

TABLE 2

QUALITY DATA OF UNIFORM REGIONAL NURSERY BLENDS

1980 CROP

VARIETY OR SEL. NO.	T.A. 1/	1000 WT.	KERNEL SIZE LG	MED	SM	WHT. VIN. 2/	WHT. TYP. 2/	KERN. CHAR. 3/	FLR. EXT. %	MIN.B ESTEA. 2/	FLR. PRD. %	ML CHAR. 4/	% G. PER. 5/	MIX. ABS. 2/	MIX. PAT. 5/	BAKE ABS. 2/	MIX. TIME MIN.	DOUGH CHAR. 6/	CRUMB COLOR 7/	CRUMB GRAIN 8/	LOAF VOL. 2/	BAKE EVAL. 3/	GEN. EVAL. 8/	MINOR DEFICIENCY	MAJOR DEFICIENCY
	%/MO.	G.	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	CC.	%	%		
SOUTHEASTERN REGION																									
BUTTE	60.0	27.2	21	7A	5	1.03	14.2	3	70.3	0.42	13.3	1	2	60.6	5	57.3	3.25	4	130.5	8A.89	920	4	3	BD	
CARIS	59.9	25.3	16	59	6	1.04	15.0	3	69.2	0.40	14.A	1	2	66.3	8	55.5	3.25	3	100.0	8A.99	945	E	4	LG	
ERA	59.5	23.9	16	75	9	1.0A	13.7	6	69.9	0.42	13.0	1	3	64.7	5	59.8	A.25	3	101.0	86.83	930	5	2	WP	BA
MARQUIS	57.1	27.3	20	72	8	1.03	14.5	A	69.4	0.45	13.9	1	A	67.3	6	05.8	3.75	3	103.0	88.87	960	4	E	TW	M65 3A
AALDROM	58.6	29.5	32	62	A	1.07	15.9	3	69.3	0.45	14.2	1	4	AA.3	5	57.5	4.25	3	139.7	87.85	875	2	3	MA9	
MS 7666	56.7	25.7	27	69	8	1.08	13.5	5	53.0	0.42	13.2	1	3	62.5	7	63.0	6.00	3	131.7	89.90	985	8	1	TW	WP M1	8A
MS 7613A	57.A	27.E	6	84	10	1.01	13.9	6	60.1	0.A0	13.7	1	3	64.2	5	06.1	6.15	3	131.5	89.70	930	4	3	TW	WP BA	LG
KY 0161	56.0	23.6	15	76	11	1.02	13.2	8	60.6	0.30	12.9	1	2	63.5	8	61.2	7.53	8	100.8	86.89	930	8	1	TW	LG SM OD	WP BA MT
KN 7222	57.9	24.9	15	7A	11	1.07	13.8	7	70.3	0.42	13.3	1	3	63.5	3	64.8	5.30	3	133.8	89.89	970	8	E	TW	KW LO SM WP MT	DA
MN 7357	55.3	20.5	2A	69	7	1.A2	13.7	A	70.3	0.41	13.0	1	2	AA.3	7	67.3	5.85	2	101.7	88.10	890	A	3	OD		W?
KN 70173R	59.3	24.0	13	77	10	1.01	13.8	5	71.2	0.42	13.3	1	3	63.2	5	63.8	5.80	3	131.3	87.85	955	8	1	KW	LG WP	DA
MN 7316A	57.7	28.0	22	78	0	1.04	13.8	5	69.7	0.35	13.3	1	A	63.7	6	66.3	5.50	2	100.6	87.85	935	5	1	TW	AB M1 OD	M65
NE 7648	59.1	25.3	13	76	11	1.03	14.1	5	69.2	0.45	13.9	1	A	65.7	8	57.1	7.31	3	109.0	87.87	950	8	3	LG	SM M85 MT	
NE 7035	58.4	29.8	17	77	6	1.04	13.6	6	69.3	0.41	13.5	1	2	65.3	7	66.2	6.00	3	139.8	84.99	920	3	3	W?	M1	
ND 509	58.2	29.A	48	55	5	1.A3	14.9	A	69.7	0.42	13.3	1	3	65.3	6	67.A	A.50	3	100.0	8A.85	950	2	A	WP	
ND 572	58.8	20.4	29	66	5	1.02	14.5	2	68.2	0.42	13.7	1	3	65.0	5	69.4	3.50	3	139.5	87.87	955	4	3	04	
ND 573	59.2	27.2	17	78	5	1.00	11.1	4	69.4	0.A1	13.5	1	2	65.0	5	66.5	4.00	3	138.5	53.73	885	4	3	8A	
ND 574	57.1	32.1	A0	50	E	1.03	14.2	3	69.1	0.A3	13.5	1	3	63.3	5	60.3	3.50	3	100.6	80.89	945	E	4		
ND 575	57.A	29.6	32	62	6	1.07	14.3	5	68.2	0.AA	13.3	1	A	67.9	8	69.5	A.50	3	101.5	86.89	930	2	3	TW	WP M65	
NC 755 2A3I	58.6	27.7	29	6A	7	1.78	13.8	5	65.7	0.49	12.9	1	A	64.A	A	65.4	3.50	4	118.8	89.99	875	6	1	W?	BA OD	M65
NK 755 2636	53.1	25.5	20	72	8	1.02	13.5	6	69.9	0.43	12.8	1	3	63.8	5	04.5	4.33	3	99.5	88.89	875	8	1	TW	WP	84
3L 4352	58.6	27.7	29	66	5	1.05	15.4	3	63.6	0.46	14.6	1	8	64.7	8	69.4	3.50	3	130.8	89.99	950	4	1	04		M65
SJ 2703	59.5	32.0	35	59	A	1.7A	14.0	A	66.9	0.46	13.1	1	8	64.4	7	65.A	7.09	3	110.0	87.85	925	5	1	WP	SA MT	M55
SD 2035	59.3	35.3	25	60	6	1.03	13.9	A	69.4	0.42	13.5	1	3	6A.2	5	55.9	4.33	3	101.5	50.03	965	4	3	W?	8A	
SJ 2868	80.8	26.A	11	A1	A	1.A2	14.2	5	70.7	0.38	13.8	1	E	67.0	8	A7.7	4.00	3	131.5	89.99	925	2	4	LG		
SJ 2870	59.5	25.9	11	83	6	1.79	14.8	3	70.2	0.A2	14.0	1	3	62.5	4	53.3	3.25	4	101.8	89.99	915	8	1	LG	BD	8A
MA 0756	57.8	29.2	34	57	7	1.79	13.2	6	69.6	0.4A	12.9	1	3	63.2	6	6A.1	5.25	3	100.5	88.87	870	8	1	TW	M65	WP 8A
MA 0758	57.4	27.1	9	81	10	1.72	12.3	8	69.8	0.41	12.1	1	2	61.0	8	62.1	3.75	3	101.8	89.89	925	8	1	TW	LG	WP 8A
R 5715	55.5	26.3	15	73	9	1.79	13.8	9	70.4	0.A3	13.A	1	3	63.7	8	55.5	7.73	2	131.8	86.87	8A0	8	1	WP	33	MT
R 8753	59.A	2A.6	15	78	9	1.81	13.2	7	71.3	0.A2	12.A	1	2	63.5	8	6A.1	4.25	3	131.8	88.87	915	8	1	KW	LG	W? 54

1/ CLEAN DRY - SUBTRACT 1 .5-/3U- FOR DOCKAGE-FREE T.W.

2/ 14% MOISTURE BASIS.

3/ 1 = VERY SATISFACTORY. 2 = SATISFACTORY. 3 = SATISFACTORY-QUESTIONABLE. A = QUESTIONABLE-SATISFACTORY. 5 = QUESTIONABLE. 6 = QUESTIONABLE-UNSATISFACTORY. 7 = UNSATISFACTORY-QUESTIONABLE. 8 = UNSATISFACTORY.

4/ 1 = NORMAL. 2 = NORMAL-SOFT. 3 = SOFT-NORMAL. 4 = SOFT. 5 = GRITTY. 6 = VERY SOFT.

5/ REFER TO REFERENCE MIXOGRAMS FOR NUMERICAL CURVE PATTERN. 11 = VERY WEAK --- 11 = VERY STRONG.

6/ 1 = BUCKY. 2 = VERY ELASTIC. 3 = ELASTIC. A = ELASTIC-PLIABLE. 5 = PLIABLE-ELASTIC. 6 = PLIABLE. 7 = PLIABLE-WEAK. 8 = WEAK-PLIABLE. 9 = WEAK. 10 = VERY WEAK. 20 = SLIGHTLY DEAD. 30 = DEAD.

7/ AXA.9 = BRIGHT WHITE. XXX.6 = WHITE. AXX.7 = SLIGHTLY CREAMY. AAA.6 = BRIGHT CREAMY. XAX.5 = CREAMY. XAX.4 = VERY CREAMY. AXA.3 = GRAY. XXA.7 = DULL GRAY. AAA.1 = VERY GRAY.

8/ XXA.00 = SUGGY. AXA.01 = THICK WALL OR NARSN. XAX.03 = CLOSE. AAA.35 = OPEN. IRREGULAR. XAA.06 = OPEN,SLIGHTLY IRREGULAR. AXA.37 = IRREGULAR-OPEN. AAX.09 = OPEN. AAA.10 = IRREGULAR. XAX.33 = SLIGHTLY OPEN,IRREGULAR. AXA.50 = SLIGHTLY IRREGULAR-OPEN. XAX.70 = SLIGHTLY OPEN. XXA.90 = SLIGHTLY IRREGULAR. XAA.99 = NORMAL.

9/ 1 = NO PROMISE. 2 = LITTLE PROMISE. 3 = SOME PROMISE. 4 = GOOD PROMISE.

TABLE 3

QUALITY DATA OF UNIFORM REGIONAL NURSERY STANDS

1953 CROP

VARIETY OR SEL. NO.	T.W. 1/ (LB.)	1000 GR.	KERNEL SIZE LG.	KERNEL SIZE MED.	KERNEL SIZE SM.	WHIT. MIN.	WHIT. PRO.	KERN. CHAR.	FLR. EXT.	MIN.& DEVEL.	FLR. PRO.	MLG CHAR.	MLG. PER.	MIX. ABS.	MIX. PAT.	BAKE ABS.	MIX. TIME MIN.	DOUGH CHAR.	CRUMB COLOR	CRUMB GRAIN	LOAF VOL.	BAKE EVAL.	GEN. EVAL.	MINOR DEFICIENCY	MAJOR DEFICIENCY
	(LB.)	G.	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	CC.	%	%		
WESTERN REGION																									
BIETE	60.6	30.5	22	76	2	1.66	15.2	2	70.1	0.35	14.5	1	2	67.8	5	67.3	3.90	3	101.7	00.00	945	2	A		
CIRIS	59.5	27.5	11	85	A	1.66	15.9	A	70.2	0.36	15.3	1	2	67.3	4	57.3	3.25	3	101.0	07.09	865	2	4	KW LG	
ERA	69.1	28.9	24	72	A	1.64A	14.1	6	71.2	0.38	13.3	1	3	6A.7	5	65.1	4.00	3	101.0	06.03	979	4	3	M65 BA	WP
WARGJIS	53.2	29.6	22	76	2	1.74	15.7	2	66.9	0.43	15.1	1	5	69.1	5	69.7	3.50	3	102.0	06.03	99*	2	3		M65
BALORON	59.3	32.1	36	63	2	1.74	15.7	2	70.0	0.38	14.9	1	3	65.6	0	55.5	3.75	3	133.0	05.09	13*	2	4	M65	
MS 7604	58.4	32.0	29	68	3	1.66	13.5	5	71.1	0.39	13.3	1	4	63.5	6	63.8	6.00	3	132.7	08.99	950	8	1	M65 NT	WP 54
MS 76103	59.4	33.6	24	73	3	1.62	13.9	5	71.5	0.37	13.7	1	2	67.3	6	67.9	5.00	2	131.6	08.99	910	6	2	NT 00	WP
LJ 0157	59.4	31.2	19	80	5	1.65	13.6	6	71.4	0.34	13.1	1	1	63.6	7	66.1	6.25	2	131.0	06.10	995	8	1	LG SM NT 00	WP 6A
44 7222	59.1	29.6	21	76	4	1.64	13.9	5	71.9	0.37	13.1	1	2	6A.A	5	65.1	4.25	3	102.0	07.07	915	4	3	BA	WP
WW 7337	58.6	31.3	29	68	3	1.63	14.3	5	70.6	0.39	13.8	1	4	67.3	7	64.2	5.00	2	111.3	06.10	915	6	2	WP M65 NT 00	
WW 70179R	59.2	28.6	20	79	5	1.74	15.0	5	72.2	0.37	14.5	1	2	66.3	A	67.3	3.50	3	133.0	08.03	990	2	A	SM	
WW 73165	55.1	31.1	29	67	A	1.70	14.6	6	70.0	0.43	14.2	1	5	67.3	6	63.1	5.50	2	108.7	06.09	1800	5	2	TW WP NT 00	M65
MT 7646	59.1	25.2	15	79	6	1.76	15.3	A	69.7	0.39	14.9	1	A	66.0	7	57.1	6.00	3	130.0	07.09	1025	3	3	LG SM M65 NT	
WI 7836	59.3	33.2	29	68	3	1.71	15.0	4	69.9	0.37	14.7	1	3	66.6	6	67.9	4.75	2	112.9	07.09	980	4	3	00	
WD 669	57.4	35.6	45	53	2	1.71	14.6	5	69.5	0.35	14.0	1	2	66.3	0	67.4	3.75	2	103.6	01.09	1347	4	3	WP 00	
WD 572	59.9	32.0	31	67	2	1.67	15.4	2	66.9	0.37	14.1	1	3	66.3	5	66.3	3.50	3	139.0	07.09	950	2	A		
WD 573	60.9	30.6	25	73	2	1.69	15.4	2	69.6	0.43	14.9	1	5	67.0	4	67.9	3.25	2	132.0	06.05	1895	4	2	WP	M65
WD 574	58.6	34.0	39	58	3	1.72	16.0	3	68.6	0.39	15.1	1	5	67.3	5	67.9	3.00	4	102.0	06.07	1330	A	2	M65 00	
WD 575	59.5	34.2	41	57	2	1.71	15.5	2	69.6	0.43	14.9	1	5	67.9	6	68.4	3.75	3	102.7	00.09	1020	2	3		M65
WW 755 2631	58.0	30.A	29	67	A	1.64	13.3	4	69.8	0.41	14.3	1	6	62.3	3	62.9	3.50	4	132.0	00.99	940	6	1	00	M65 BA
WW 755 2634	59.1	33.4	31	66	3	1.63	14.3	5	72.3	0.35	13.6	1	1	64.2	A	51.5	3.75	3	103.8	06.05	950	8	3	WP	BA
RL A352	59.4	29.7	21	76	3	1.66	16.2	3	70.2	0.30	15.7	1	3	67.9	5	60.5	3.25	3	110.2	07.09	915	3	3	M65	
SD 2733	59.4	38.4	42	55	3	1.6A	15.5	2	66.8	0.43	14.6	1	0	66.8	7	67.1	6.25	3	132.0	06.09	1020	3	1	NT	M65
SD 2815	53.5	31.5	20	70	2	1.65	15.3	2	69.3	0.35	14.7	1	2	67.6	6	53.3	4.25	4	102.7	05.05	985	4	3	00	
SD 2368	61.2	39.9	16	80	2	1.56	15.3	3	71.2	0.33	14.7	1	2	65.7	A	66.A	2.75	4	103.0	07.99	965	4	3	00	
SD 2670	61.1	29.3	14	83	3	1.67	15.9	3	60.7	0.A3	15.3	1	6	65.7	4	55.5	2.53	4	101.0	00.00	920	5	1	LG 00	M65
W4 6756	58.7	32.0	32	64	A	1.63	14.1	6	71.3	0.41	13.6	1	A	64.7	6	65.6	6.00	3	131.0	07.09	1026	8	1	OA NT	WP W65
W4 6753	59.4	30.6	13	82	5	1.50	13.7	6	70.6	0.33	13.0	1	2	63.2	6	63.0	3.50	3	131.0	06.99	940	6	1	LG SM	WP 64
K 3713	59.3	32.2	26	71	3	1.63	14.9	4	71.2	0.36	14.1	1	3	67.3	7	67.9	0.03	2	101.0	07.10	925	0	2	M65 NT 00	
K 3753	63.1	25.4	23	74	6	1.63	14.2	6	71.6	0.37	13.3	1	2	64.4	6	65.1	3.75	3	112.0	07.09	950	4	3	SM WP 0A	

1/ CLEAN DRY - SUBTRACT 1 LB./BU. FOR DOCKAGE-FREE T.W.

2/ 14% MOISTURE BASIS.

3/ 1 = VERY SATISFACTORY, 2 = SATISFACTORY, 3 = SATISFACTORY-QUESTIONABLE, 4 = QUESTIONABLE-SALESPACTORY, 5 = QUESTIONABLE, 6 = QUESTIONABLE-UNSATISFACTORY, 7 = UNSATISFACTORY-QUESTIONABLE, 8 = UNSATISFACTORY.

4/ 1 = NORMAL, 2 = NORMAL-SOFT, 3 = SOFT-NORMAL, 4 = SOFT, 5 = GRITTY, 6 = VERY SOFT.

5/ REFER TO REFERENCE MIXOGRAMS FOR NUMERICAL CURVE PATTERN. 11 = VERY WEAK --- 11 = VERY STRONG.

6/ 1 = BUCKY, 2 = VERY ELASTIC, 3 = ELASTIC, A = ELASTIC-PLIABLE, 5 = PLIABLE-ELASTIC, 6 = PLIABLE, 7 = PLIABLE-WEAK, 8 = WEAK-PLIABLE, 9 = WEAK, 10 = VERY WEAK, 20 = SLIGHTLY DEAD, 30 = DEAD.

7/ XXX.9 = BRIGHT WHITE, XXX.8 = WHITE, XXX.7 = SLIGHTLY CREAMY, XXX.6 = BRIGHT CREAMY, XXX.5 = CREAMY, XX4.4 = VERY CREAMY, XX.3 = GRAY, XXX.2 = DULL GRAY, XXX.1 = VERY GRAY.

8/ XXX.09 = SOGGY, XXX.01 = THICK WALL (O HARSH, XXX.33 = C.3IE, XXX.35 = OPEN, IRREGULAR, XXX.96 = OPEN.SLIGHTLY IRREGULAR, XX.97 = IRREGULAR.OPEN, XXX.09 = OPEN, XXX.10 = IRREGULAR, XXX.33 = SLIGHTLY OPEN.IRREGULAR, XXX.50 = SLIGHTLY IRREGULAR.OPEN, XXX.70 = SLIGHTLY OPEN, XXX.99 = SLIGHTLY IRREGULAR, XXX.99 = NORMAL.

9/ 1 = NO PROMISE, 2 = LITTLE PROMISE, 3 = SOME PROMISE, 4 = GOOD PROMISE.

TABLE 4

QUALITY DATA OF UNIFORM REGIONAL NURSERY BLENDS

1980 CROP

VARIETY OR SEL. NO.	T.W. LB/BU.	1000 KWT. G.	KERNEL SIZE LG %	MED %	SM %	WHT. MIN. %	WHT. PRO. %	KERN. CHAR. 1/	FLR. EXT. %	MIN.@ 65%EXT. %	FLR. PRO. %	MLG CHAR. 2/	MLG PER. 3/	MIX. ABS. %	MIX. PAT. 5/	BAKE ABS. %	MIX. TIME MIN.	DOUGH CHAR. 6/	CRUMB COLOR 7/	CRUMB GRAIN 8/	LOAF VOL. CC.	BAKE EVAL. 3/	GEN. EVAL. 9/	MINOR DEFICIENCY	MAJOR DEFICIENCY
SOUTHEASTERN AREA AVERAGES																									
WHITE	60.6	27.2	21	74	5	1.83	14.2	3	70.3	0.39	13.6	1	1	66.8	5	67.3	3.25	4	100.9	88.09	920	4	3	WP DQ	
CHRIS	59.9	26.9	14	80	6	1.84	15.6	3	69.2	0.40	14.4	1	2	66.3	5	66.5	3.25	3	100.0	88.00	945	2	4	LG	
ERA	59.5	29.9	16	75	9	1.84	13.7	4	69.8	0.42	13.0	1	3	64.7	5	65.6	4.25	5	101.0	88.05	930	5	2	BA SM M65	WP
WALDRON	59.8	28.5	32	62	8	1.97	15.0	3	69.3	0.45	14.2	1	4	65.5	5	67.5	4.25	3	100.7	87.05	875	3	2	MT M65	
AREA AVERAGE	59.6	27.7	22	71	7	1.84	13.9	8	69.9	0.43	13.4	1	4	64.8	6	65.6	4.75	3	100.7	88.04	923	3	2	SM M65 BA	WP
NORTHEASTERN AREA AVERAGES																									
WHITE	61.6	32.9	43	56	1	1.55	14.7	2	71.7	0.34	13.9	1	2	68.5	6	68.7	4.25	3	100.0	87.99	885	2	4	WP	
CHRIS	60.0	30.3	27	72	1	1.96	15.3	3	70.2	0.35	14.8	1	2	68.5	6	69.2	3.75	3	100.0	88.09	923	2	4	LG	
ERA	61.0	31.6	42	57	1	1.96	13.5	3	72.0	0.37	12.9	1	3	64.2	5	65.1	4.00	3	101.0	87.89	945	0	1	M65	WP BA
WALDRON	59.4	34.0	57	42	1	1.69	15.8	4	70.2	0.37	14.8	1	3	67.9	6	68.9	4.25	3	100.0	88.05	970	2	4	LG5	
AREA AVERAGE	60.1	34.5	47	52	1	1.62	14.4	4	70.5	0.37	13.6	1	4	66.3	6	67.1	4.75	3	101.0	87.04	940	5	2	WP M65 MT	
WESTERN AREA AVERAGES																									
WHITE	60.5	30.5	22	76	2	1.66	15.2	3	70.1	0.35	14.6	1	2	67.0	5	67.3	3.00	3	101.7	88.09	945	4	4		
CHRIS	59.6	27.5	11	85	4	1.66	15.9	3	70.2	0.36	15.3	1	3	67.3	4	67.3	3.25	3	101.0	87.09	965	2	4	LG SM	
ERA	60.1	29.9	24	72	4	1.68	14.1	3	71.2	0.35	13.3	1	3	64.7	5	65.1	4.00	3	101.0	88.09	976	4	4	SM WP M65 BA	
WALDRON	59.3	32.1	38	60	2	1.74	15.7	3	70.0	0.36	14.9	1	3	66.6	5	66.6	3.75	3	103.0	85.09	1035	2	4	M65	
AREA AVERAGE	59.9	29.9	24	73	3	1.68	15.2	4	70.4	0.37	14.5	1	4	66.4	5	66.7	3.50	3	101.6	87.09	978	4	3	SM M65	
CROP YEAR AVERAGES																									
1977 AVERAGE	60.0	34.4	28	68	4	1.63	14.6	5	70.6	0.39	13.5	1	2	64.4	4	65.4	3.50	4	100.7	88.05	916	4	3	SM M65	
1978 AVERAGE	59.8	34.9	36	60	4	1.75	14.3	5	70.7	0.40	13.6	1	3	63.6	4	63.7	3.25	4	101.0	87.03	935	5	4	SM M65	
1979 AVERAGE	59.8	31.7	30	63	3	1.66	13.7	5	69.7	0.39	12.7	1	3	63.0	5	64.1	4.00	3	101.0	88.06	944	4	3	SM M65	BA
1980 AVERAGE	59.6	31.1	32	64	4	1.71	14.4	5	70.0	0.39	13.7	1	3	65.7	6	66.5	4.50	3	101.0	88.04	948	5	3	SM M65 MT	
1977-80 AVG	60.0	33.0	33	63	4	1.69	14.3	5	70.3	0.39	13.4	1	3	64.2	5	64.9	4.00	4	101.0	88.05	936	5	3	SM M65 BA	

1/ CLEAN DRY - SUBTRACT 1 LB./BU. FOR DOCKAGE-FREE T.W.

2/ 14% MOISTURE BASIS.

3/ 1 = VERY SATISFACTORY, 2 = SATISFACTORY, 3 = SATISFACTORY-QUESTIONABLE, 4 = QUESTIONABLE-SATISFACTORY, 5 = QUESTIONABLE, 6 = QUESTIONABLE-UNSATISFACTORY, 7 = UNSATISFACTORY-QUESTIONABLE, 8 = UNSATISFACTORY.

4/ 1 = NORMAL, 2 = NORMAL-SOFT, 3 = SOFT-NORMAL, 4 = SOFT, 5 = GRITTY, 6 = VERY SOFT.

5/ REFER TO REFERENCE MIXOGRAMS FOR NUMERICAL CURVE PATTERN. 11 = VERY WEAK --- 11 = VERY STRONG)

6/ 1 = BUCKY, 2 = VERY ELASTIC, 3 = ELASTIC, 4 = ELASTIC-PLIABLE, 5 = PLIABLE-ELASTIC, 6 = PLIABLE, 7 = PLIABLE-WEAK, 8 = WEAK-PLIABLE, 9 = WEAK, 16 = VERY WEAK, 20 = SLIGHTLY DEAD, 30 = DEAD.

7/ XXX.9 = BRIGHT WHITE, XXX.8 = WHITE, XXX.7 = SLIGHTLY CREAMY, XXX.6 = BRIGHT CREAMY, XXX.5 = CREAMY, XXX.4 = VERY CREAMY, XXX.3 = GRAY, XXX.2 = DULL GRAY, XXX.1 = VERY GRAY.

8/ XXX.00 = SOGGY, XXX.01 = INICK WALL OR MARSH, XXX.07 = CLOSE, XXX.05 = OPEN, IRREGULAR, XXX.08 = OPEN-SLIGHTLY IRREGULAR, XXX.07 = IRREGULAR-OPEN, XXX.09 = OPEN, XXX.10 = IRREGULAR, XXX.30 = SLIGHTLY OPEN-IRREGULAR, XXX.50 = SLIGHTLY IRREGULAR-OPEN, XXX.70 = SLIGHTLY OPEN, XXX.90 = SLIGHTLY IRREGULAR, XXX.99 = NORMAL.

9/ 1 = NO PROMISE, 2 = LITTLE PROMISE, 3 = SOME PROMISE, 4 = GOOD PROMISE.

TABLE 5

QUALITY DATA OF SPECIAL UNBLENDED UNIFORM NURSERY SAMPLES

1980 CROP

VARIETY OR SEL. NO.	T.W.	1000 KWT.	KERNEL SIZE LG	KERNEL SIZE MED	KERNEL SIZE SM	WHIT. MEN.	WHI. PRO.	KERN. CHAR.	FLO. EXT.	MIN.B BREAK.	FLO. PRT.	MLG CHAR.	MLG PEN.	MIX. ABS.	MIX. TIME	BAKE ABS.	MIX. TIME	DOUGH CHAR.	CRUMB COLOR	CRUMB GRAIN	LOAF VOL.	BAKE EVAL.	GEN. EVAL.	MINOR DEFICIENCY	MAJOR DEFICIENCY
	1/																MIN.				CC.				
	%30.	G.	%	%	%	%	%	%	%	%	%	%	%	%	%	%		%	%	%		%	%		
IDAHO, IDAHO																									
BUTTE	59.0	29.0	18	78	4	1.66	13.5	3	47.9	0.51	13.4	1	8	65.7	4	65.7	3.00	10	99.5	80.01	143	6	1	LG		EX DO
CHRIS	61.5	29.3	28	70	2	1.70	13.4	3	50.9	0.59	13.2	1	2	66.2	4	64.2	3.59	8	99.7	82.01	140	7	2	DL		DO
ELA	30.3	29.8	31	66	3	1.65	13.3	4	46.3	0.61	13.1	1	6	83.0	4	52.5	4.75	10	88.3	75.03	120	6	1	WY	MAS PO MT COL LV	EX BA DO
MANDUS	60.0	32.5	57	41	2	1.83	13.5	2	52.3	0.56	13.6	1	2	65.7	4	65.7	3.50	8	98.0	85.01	147	5	5			DO
WALDRON	57.5	31.7	49	48	3	1.84	13.1	3	51.0	0.51	14.3	1	8	67.3	4	67.3	2.75	7	99.0	84.01	151	5	1	TW	WH	MAS DO
US 7666	58.3	30.2	53	44	3	1.74	13.5	4	44.8	0.59	12.2	1	8	82.3	4	62.3	4.50	10	98.5	75.00	130	6	1	PO	LV	EX BA DO
US 74103	59.5	30.5	40	55	5	1.67	14.3	5	49.5	0.56	14.1	1	3	65.5	5	68.8	2.75	6	100.5	84.01	175	4	1	EX		FW DO
ID 0167	57.0	28.8	31	59	10	1.83	14.0	4	46.3	0.65	13.3	1	6	69.3	4	65.3	3.25	8	98.3	80.01	155	5	1	TW	COL	SW EX MAS DO
MN 7222	56.0	30.4	43	54	3	1.91	14.1	8	43.2	0.63	13.6	1	8	66.6	5	66.6	3.00	5	97.5	78.01	153	5	1	WW	MAS	IW EX DO
MN 7357	54.9	31.8	36	61	3	1.72	12.4	5	40.3	0.59	11.5	1	5	62.9	4	62.9	4.75	8	96.3	75.00	146	8	1	WP	EX PO MT	DA DO
MN 70170 R	58.3	32.3	58	42	3	1.73	13.7	3	47.0	0.63	13.1	1	8	66.6	4	55.5	3.33	5	96.8	75.33	155	5	1			EX DO
MN 73168	57.3	33.0	53	44	3	1.77	14.3	3	53.1	0.59	13.8	1	4	67.5	5	67.6	2.75	8	99.8	78.01	157	5	2	FW		MAS DO
MI 7443	59.5	29.5	23	75	2	1.83	14.0	2	49.7	0.55	13.8	1	3	66.6	6	66.5	4.00	8	98.0	80.01	150	5	2			DO
MI 7836	53.3	23.5	32	64	4	1.85	14.6	4	47.4	0.64	14.4	1	8	68.5	5	53.5	3.03	6	95.0	80.01	170	4	1	WH		TW EX MAS DO
MI 7836	58.0	27.7	32	65	3	1.85	14.5	3	44.4	0.64	13.8	1	7	69.3	3	65.3	3.00	9	89.0	76.09	131	5	1	KW	WH COL	EX MAS DO
MO 572	53.3	33.5	60	37	3	1.72	13.0	5	47.0	0.56	11.8	1	8	65.3	4	65.3	4.23	13	37.5	75.00	138	6	1	WP	PO LV	EX DO
MO 573	50.8	27.5	26	71	3	1.87	13.1	4	47.8	0.56	14.9	1	8	68.5	5	68.5	2.25	8	93.8	82.01	165	6	1	KW	WH	EX DO
MO 574	56.5	31.2	45	52	3	1.93	14.9	3	42.9	0.51	14.7	1	8	67.5	4	67.6	2.50	8	97.3	80.01	168	5	1	IW	WH MAS	EX DO
NK 795 2631	56.5	31.1	46	51	3	1.75	13.4	4	44.7	0.67	11.9	1	8	63.3	5	63.0	3.25	9	95.3	75.03	135	7	1	IW	BA DO LW	EX MAS PO
NK 795 2634	59.0	28.2	35	52	3	1.75	12.9	5	46.9	0.65	11.5	1	8	61.6	8	61.6	5.50	30	97.3	70.00	105	8	1	WP	MI COL GR	EX MAS PO BA DO LV
RL 6352	51.3	30.7	38	61	1	1.69	14.6	2	45.3	0.89	13.6	1	8	67.3	4	67.3	3.00	10	96.8	78.01	140	5	1	PO	DO	EX MAS
SD 2700	56.5	32.8	51	46	3	1.78	15.1	3	48.9	0.68	14.9	1	8	69.5	6	69.5	3.75	6	98.8	80.01	170	4	1	FW		EX MAS DO
SD 2815	58.5	29.8	37	59	4	1.87	13.9	3	50.0	0.59	13.7	1	3	67.0	4	67.0	3.00	9	90.5	79.01	155	4	3	WH	DO	
SD 2965	57.5	28.0	33	64	3	1.80	14.1	3	49.6	0.52	13.9	1	3	63.5	5	63.8	2.00	8	130.5	83.01	160	7	2	IW	EX BA	DO
SD 2979	54.1	25.9	7	87	6	1.77	14.3	8	46.6	0.65	14.1	1	8	69.8	3	54.3	2.25	9	99.5	78.01	146	4	1	KW	SW DO	LG EX MAS
WA 6756	56.5	32.7	54	41	5	1.85	12.9	8	44.1	0.37	11.7	1	8	61.6	3	61.6	3.75	9	84.3	75.00	135	8	1	WH	WP PO DO COL LV	FW EX DO
WA 5751	58.8	33.5	21	76	3	1.79	12.9	6	46.7	0.56	11.5	1	8	62.3	4	62.3	4.53	11	85.3	78.00	115	6	1	LG	WP	EX PO BA DO LV
X 6710	56.5	31.7	47	50	3	1.72	14.9	3	45.4	0.55	14.7	1	8	69.7	6	69.7	3.25	7	25.5	81.01	168	4	1	FW		EX MAS DO
X 6753	58.0	27.3	33	63	4	1.82	13.9	4	44.4	0.63	12.3	1	8	63.5	A	63.8	4.25	10	88.5	70.00	120	8	1	KW	BA COL GR	EX MAS PO DO LV

1/ CLEAN DRY - SUBTRACT 1 LB./30. FOR DOCKAGE-FREE T.W.

2/ 14% MOISTURE BASIS.

3/ 1 = VERY SATISFACTORY, 2 = SATISFACTORY, 3 = SATISFACTORY-QUESTIONABLE, 4 = QUESTIONABLE-SATISFACTORY, 5 = QUESTIONABLE-UNSATISFACTORY, 7 = UNSATISFACTORY-QUESTIONABLE, 9 = UNSATISFACTORY.

4/ 1 = NORMAL, 2 = NORMAL-SOFT, 3 = SOFT-NORMAL, 4 = SOFT, 5 = GRITTY, 6 = VERY SOFT.

5/ TESTED TO REFERENCE MIXOGRAMS FOR NUMERICAL CURVE PATTERN. (1 = VERY WEAK --- 11 = VERY STRONG)

6/ 1 = BUCKY, 2 = VERY ELASTIC, 3 = ELASTIC, 4 = ELASTIC-PLIABLE, 5 = PLIABLE-ELASTIC, 6 = PLIABLE, 7 = PLIABLE-WEAK, 8 = WEAK-PLIABLE, 9 = WEAK, 10 = VERY WEAK, 20 = SLIGHTLY DEAD, 30 = DEAD.

7/ XXX.9 = BRIGHT WHITE, XXX.8 = WHITE, XXX.7 = SLIGHTLY CREAMY, XXX.6 = BRIGHT CREAMY, XXX.5 = CREAMY, XXX.4 = VERY CREAMY, XXX.3 = GRAY, XXX.2 = DULL GRAY, XXX.1 = VERY GRAY.

8/ XXX.00 = SOGGY, XXX.01 = THICK WALL OR HARSH, XXX.33 = CLOSE, XXX.35 = OPEN, IRREGULAR, XXX.06 = OPEN-SLIGHTLY IRREGULAR, XXX.07 = IRREGULAR-OPEN, XXX.39 = OPEN, XXX.13 = IRREGULAR, XXX.30 = SLIGHTLY OPEN-IRREGULAR, XXX.50 = SLIGHTLY IRREGULAR-OPEN, XXX.70 = SLIGHTLY OPEN, XXX.90 = NORMAL.

9/ 1 = NO PROMISE, 2 = LITTLE PROMISE, 3 = SOME PROMISE, 4 = GOOD PROMISE.

TABLE 6

SPECIAL UNIFORM NURSERY SAMPLES NOT INCLUDED IN THE BLENDS

1980 CROP

VARIETY OR SEL. NO.	T.W. 1/	1000 KNL.	KERNEL SIZE LG	MED	SM	WHT. MIN. 2/	WHT. PRO. 2/	KERN. CHAR. 3/	FLR. EXT. 4/	MIN.@ 6%MOIST. 2/	FLR. PTB. 5/	MLG. CHAR. 3/	MLG. PTB. 3/	MIX. ABS. 2/	MIX. PAT. 5/	BAKE ABS. 2/	MIX. TIME MIN.	DOUGH CHAR. 6/	CRUMB CL.ST 12/	CRUMB GRAIN 9/	LOAF VOL. 2/	BAKE EVAL. 3/	GEN. EVAL. 9/	MINOR DEFICIENCY	MAJOR DEFICIENCY
	LB/BU.	G.	%	%	%	%	%	3/	%	%	%	3/	%	%	%	%	MIN.			9/	CC.	3/	9/		
PULLMAN, WASHINGTON																									
BUTTE	53.3	34.7	42	57	1	1.37	11.2	2	55.6	0.45	10.6	1	3	57.3	3	59.3	3.75	7	193.6	87.09	142	5	2	OA LV	
CATIS	62.5	33.8	47	52	1	1.40	11.4	2	56.8	0.46	11.2	1	3	59.3	4	59.3	3.75	5	132.0	80.99	161	4	3	BA	
E24	63.6	34.2	54	44	2	1.36	9.5	A	64.2	0.43	8.9	1	1	53.2	6	51.9	5.75	A	110.5	85.09	133	8	1	SM P3 20 LV	WP BA
MARQUIS	62.0	31.7	34	64	2	1.31	12.2	3	50.5	0.50	12.9	1	4	59.3	3	59.6	A.00	8	171.3	58.09	176	3	3	XW SW 34	MAS
SAWTELL	62.9	41.5	70	28	2	1.21	11.1	4	62.0	0.38	10.9	1	1	62.8	5	62.8	5.00	5	191.0	87.01	177	2	4	SM	
WALDRON	32.3	35.8	50	43	1	1.31	12.2	2	57.9	0.43	12.3	1	2	62.3	5	62.5	4.25	5	131.0	88.09	174	3	4		
WAMPUM	62.6	37.2	55	43	1	1.20	11.9	2	59.3	0.33	11.7	1	1	62.8	3	32.9	2.51	5	182.0	80.09	179	3	4		
WS 7604	62.5	41.8	71	27	2	1.30	11.5	2	61.7	0.39	11.9	1	1	58.7	8	54.7	6.50	6	11323	86.09	160	6	3	SW 84 NT	
WS 74103	63.0	35.0	30	60	2	1.17	10.4	6	63.1	0.35	10.2	1	1	59.1	4	59.7	4.03	6	112.4	84.09	161	2	4	LS SW	KP
WY 0157	53.3	34.6	44	54	2	1.35	11.9	4	63.4	0.37	10.2	1	1	54.7	11	55.7	6.93	A	132.0	85.09	174	8	1	SW W? WT	BA
WH 7222	03.5	38.3	7A	25	1	1.30	16.8	4	61.9	0.14	9.5	1	1	60.3	5	00.3	5.66	6	101.6	85.69	155	2	4	WP PD	
WH 7357	63.5	39.1	06	32	2	1.26	11.6	2	61.7	0.41	10.8	1	1	61.5	5	61.6	5.00	6	131.0	87.05	171	2	4	SM	
WH 70170 R	03.0	A0.3	79	23	1	1.35	12.3	2	50.6	0.30	12.1	1	1	64.2	6	64.2	4.25	A	132.0	87.05	181	3	4	OD	
WW 7316R	63.0	33.7	42	56	2	1.39	12.0	3	54.1	0.37	11.7	1	1	60.3	3	60.3	3.75	6	190.0	87.03	102	8	4	SM	
WY 7045	64.9	33.0	42	57	1	1.58	11.7	3	59.7	0.43	11.2	1	1	63.7	8	63.7	6.50	6	172.3	88.09	156	3	4	WW NT	
MT 7834	61.6	37.8	60	37	3	1.49	11.7	3	51.7	0.43	11.5	1	1	61.0	5	61.6	4.75	6	131.3	58.03	174	2	4	SW	
MT 569	64.3	30.4	65	34	1	1.30	11.1	2	64.0	0.37	10.3	1	1	60.7	5	63.7	4.56	6	131.0	68.99	155	2	4	PD	
MT 572	64.6	33.2	55	44	1	1.32	13.3	3	01.1	0.38	13.1	1	1	63.8	2	53.5	2.75	3	100.0	87.09	188	4	3	OD	
MT 873	02.5	35.0	02	37	1	1.33	13.1	2	59.7	0.37	12.8	1	1	64.4	4	64.4	3.25	5	130.0	87.09	176	2	4		
MT 574	61.0	30.5	70	29	1	1.56	13.1	3	59.0	0.41	12.7	1	1	63.5	5	61.9	3.25	6	100.0	88.99	104	2	4	WW	
ND 575	63.6	38.2	55	33	2	1.26	11.6	2	01.2	0.39	10.9	1	1	64.2	5	64.2	4.23	5	131.3	87.01	170	3	4	SW	
NK 755 2831	62.0	35.0	57	40	3	1.31	10.5	5	62.6	0.13	9.5	1	2	57.5	3	57.5	3.75	6	133.8	87.99	150	8	1	SW WP P3	B4
NK 755 2834	03.0	35.3	60	36	2	1.35	10.8	5	65.1	0.40	9.8	1	1	63.1	5	61.0	3.75	6	132.8	55.09	155	2	4	SW WP 30	
NL 4352	62.3	35.0	53	45	1	1.40	13.7	2	60.5	0.45	13.5	1	2	64.2	8	64.2	2.75	5	161.0	60.09	171	3	4		
SD 2733	62.0	A2.7	YA	21	1	1.37	16.2	5	61.1	0.45	9.8	1	2	59.7	9	59.7	7.67	A	190.0	87.67	152	A	A	MT	W?
SD 2835	63.3	33.3	53	45	2	1.40	11.0	5	62.4	0.43	10.5	1	1	61.0	5	51.3	4.75	6	131.7	57.03	106	2	4	TW SW WP	
SD 2860	63.0	36.5	67	52	1	1.33	11.5	2	03.7	0.38	11.6	1	1	62.3	3	62.3	3.00	5	108.7	88.99	170	3	4		
SD 2870	62.5	36.2	30	69	1	1.43	12.2	3	61.1	0.40	12.3	1	4	50.3	3	61.3	2.75	6	132.0	88.09	172	2	3	LG M65	
RA 6756	61.5	37.3	54	34	2	1.20	11.0	4	61.8	0.39	10.8	1	1	61.9	3	51.9	3.25	5	133.5	80.99	159	3	4	SW WP	
RA 6755	03.6	36.4	26	72	2	1.16	10.A	6	04.9	0.34	10.8	1	1	48.3	5	61.7	4.25	A	131.8	57.69	136	2	4	LG SW RP	
R 3718	63.6	33.0	45	51	3	1.29	11.1	4	64.2	0.36	10.2	1	1	63.7	5	63.7	4.25	6	113.5	86.09	156	2	4	SW PD	
R 0153	62.0	41.6	39	43	1	1.33	11.4	2	64.3	0.37	11.3	1	1	63.5	Y	63.5	6.25	8	140.9	88.09	166	9	A	MT	

1/ CLEAN DRY - SUBTRACT 1 LB./BU. FOR JUCKAGE-FREE T.W.
2/ 100 MOISTURE BASIS.
3/ 1 = VERY SATISFACTORY. 2 = SATISFACTORY. 3 = SATISFACTORY-QUESTIONABLE. 4 = QUESTIONABLE-SATISFACTORY. 5 = QUESTIONABLE. 6 = QUESTIONABLE-UNSATISFACTORY. 7 = UNSATISFACTORY-QUESTIONABLE. 8 = UNSATISFACTORY.
4/ 1 = NORMAL. 2 = NORMAL-SOFT. 3 = SOFT-NORMAL. 4 = SOFT. 5 = GRITTY. 6 = VERY SOFT.
5/ REFER TO REFERENCE MIKROGRAMS FOR VJNERICAL CURVE PATTERN. 11 = VERY WEAK --- 11 = VERY STRONG!
6/ 1 = DUCKY. 2 = VERY ELASTIC. 3 = ELASTIC. 4 = ELASTIC-PLIAS.E. 5 = PLIABLE-ELASTIC. 6 = PLIABLE. 7 = PLIABLE-WEAK. 8 = WEAK-PLIABLE. 9 = WEAK. 10 = VERY WEAK. 20 = SLIGHTLY DEAD. 30 = DEAD.
7/ XXX.9 = BRIGHT WHITE. XXX.8 = WHITE. XXX.7 = SLIGHTLY CREAMY. XXX.5 = BRIGHT CREAMY. 44X.5 = CREAMY. XXX.4 = VERY CREAMY. XXX.3 = GRAY. XXX.2 = DULL GRAY. XXX.1 = VERY GRAY.
8/ XXX.00 = SOGGY. XXX.01 = UNICK WALL. 3Y HARSH. XXX.03 = CLOSE. XXX.05 = OPEN. IRREGULAR. XXX.35 = OPEN.SLIGHTLY IRREGULAR. XXX.37 = IRREGULAR.OPEN. XXX.89 = OPEN. XXX.10 = IRREGULAR. XXX.30 = SLIGHTLY OPEN.IRREGULAR.
. XXX.50 = SLIGHTLY IRREGULAR.OPEN. XXX.70 = SLIGHTLY OPEN. 44X.93 = SLIGHTLY IRREGULAR. XXX.99 = NORMAL.
9/ 1 = NO PROMISE. 2 = LITTLE PROMISE. 3 = SOME PROMISE. 4 = GOOD PROMISE.

TABLE 7

SPECIAL UNIFORM NURSERY SAMPLES NOT INCLUDED IN THE BLENDS

1983 CROP

VARIETY OR SEL. NO.	T.W.	1000 KRT.	KERNEL SIZE LG	MED	SM	WHT. MIN.	WHT. PRO.	KERN. CHAR.	FLR. EXT.	MIN.D DISTEX.	FLR. PRO.	MLG CHAR.	MLG. DEG.	MLR. ASH.	MLR. PAT.	DOUGH TIME	DOUGH CHAR.	CRUMB COLOR	CRUMB GRAIN	L34F WOL.	BKRE EVAL.	GEN. EVAL.	MINOR DEFICIENCY	MAJOR DEFICIENCY
	LB/BU.	G.	%	%	%	%	%	%	%	%	%	%	%	%	%	MIN.				CC.				
MADISON, WISCONSIN																								
BUTTE	57.5	35.0	64	35	1	1.95	11.5	2	64.6	0.53	11.0	1	1	56.7	5	4.50	0	90.0	86.00	141	4	3	3D LV	
CHRIS	58.5	31.7	53	46	1	1.94	11.5	5	63.0	0.55	10.9	1	2	53.6	6	6.50	7	100.0	88.90	149	4	3	DA	
EXK	57.3	37.6	78	21	1	1.73	15.0	0	64.0	0.54	9.2	1	1	55.1	7	7.25	33	100.0	86.00	131	0	1		WP 3D LV
MARQUIS	58.0	34.7	64	35	1	1.84	11.1	3	63.4	0.49	10.3	1	4	56.0	5	6.00	7	92.0	87.99	142	3	3	EX LV	
MARQUIS	58.3	35.2	70	29	1	1.93	11.7	2	63.9	0.57	13.5	1	3	55.7	9	5.67	0	6.50	A	133.0	87.13	140	2	4		
MS 7604	58.0	41.7	80	19	1	1.83	13.3	5	61.7	0.52	8.7	1	2	55.1	11	55.1	9.00	7	100.0	86.09	151	2	4		WP
MS 74109	57.5	37.3	58	41	1	1.72	10.4	5	62.1	0.46	10.2	1	2	55.1	A	55.1	8.50	7	111.5	84.05	157	2	4		WP
ND 8157	57.5	37.5	69	29	2	1.78	10.9	0	62.9	0.46	8.9	1	1	53.5	11	53.6	10.00	8	103.0	85.00	137	0	1	SN BA MI 3D LV	WP
MN 7222	57.0	37.7	75	23	2	1.91	13.0	5	63.0	0.49	9.0	1	1	55.1	0	55.1	6.50	7	100.0	83.03	138	3	4	SN 4P LV	
MN 7357	54.0	39.5	80	19	1	1.81	15.3	5	62.9	0.13	3.5	1	2	55.7	6	55.7	5.00	7	133.0	88.05	149	2	4		WP
MN 70170 R	55.5	35.9	57	30	1	1.92	12.0	2	63.3	0.51	11.5	1	2	60.3	4	53.3	K.25	6	133.3	85.09	171	1	4		
MN 73168	58.3	39.7	81	18	1	1.84	15.2	5	62.5	0.55	9.4	1	2	56.3	6	56.3	5.25	7	100.0	88.00	150	2	4		WP
MI 7643	58.8	32.2	51	48	1	1.98	12.8	3	58.7	0.59	12.6	1	5	60.3	13	63.3	7.75	6	101.0	87.05	165	2	1		EX
MI 7835	55.5	35.2	74	25	1	1.87	11.5	2	59.8	0.52	10.7	1	4	58.1	7	55.1	6.50	6	100.0	87.07	162	2	3	EX	
WI 567	56.5	38.8	80	19	1	1.92	14.3	3	61.9	0.49	10.6	1	2	55.4	A	55.4	6.00	7	100.0	86.07	144	3	4	TW	
ND 572	57.5	35.0	72	27	1	1.80	10.4	5	61.3	0.53	9.4	1	2	54.5	7	54.8	6.25	33	133.7	88.99	134	0	1	LV	WP DO
ND 573	60.5	32.1	44	55	1	1.94	12.2	3	60.9	0.54	11.6	1	3	58.1	5	54.1	4.50	6	33.5	87.85	161	2	4		
ND 574	57.5	37.9	82	17	1	1.87	12.2	2	58.2	0.55	11.3	1	0	57.2	5	57.2	5.75	6	100.0	89.00	150	1	1		EX
ND 575	58.5	30.2	70	20	1	1.80	10.7	4	61.6	0.51	9.5	1	2	59.3	6	56.0	5.00	7	90.0	87.00	152	2	4	WP	
NK 755 7634	56.5	36.9	75	21	1	1.85	13.6	4	60.2	0.61	9.3	1	4	54.5	6	54.5	6.00	4	130.0	87.07	150	2	3	TW WP EX	
NK 755 7634	58.0	37.2	78	20	2	1.76	10.4	5	61.0	0.52	9.6	1	3	51.5	7	54.0	5.50	7	99.0	86.09	143	3	3	SM	WP
AL 4352	57.0	32.0	66	33	1	1.90	12.3	3	59.2	0.63	11.7	1	6	56.7	6	54.7	6.03	30	113.0	85.05	150	0	1	MOS	EX DO
SD 2700	57.5	30.0	79	20	1	1.91	12.4	2	55.5	0.53	11.0	1	0	56.7	10	56.7	8.00	30	92.0	85.07	143	0	1	MAS PO	EX DO
SD 2835	57.5	34.0	70	20	1	1.81	10.6	3	60.5	0.47	9.9	1	2	54.5	9	54.0	6.75	30	100.7	87.00	136	0	1	WP LV	DO
SD 2869	63.0	34.4	61	37	2	1.88	11.3	3	62.9	0.44	10.1	1	1	55.4	6	55.4	K.50	30	131.5	85.00	144	0	1	SM	DO
SD 2870	60.0	32.3	42	57	1	1.92	12.7	3	60.0	0.57	11.5	1	4	57.2	6	57.2	5.00	0	100.0	87.07	166	2	3	LG EX	
WA 6756	58.5	35.9	52	46	2	1.77	10.7	5	59.4	0.47	9.3	1	3	55.1	6	55.1	6.25	0	133.0	84.05	169	2	3	TW SN WP EX	
WA 6769	58.5	33.9	50	49	2	1.74	10.2	7	61.0	0.44	9.0	1	2	53.9	6	53.9	5.75	30	32.0	83.03	121	0	1	TW SN	WP DO LV
X 3715	57.5	41.5	76	23	1	1.85	11.3	2	59.2	0.53	10.2	1	4	56.7	11	56.7	8.25	30	100.0	84.00	136	0	1	LV	EX 3D
X 6753	57.5	34.1	69	29	2	1.72	9.8	A	63.2	0.40	A.A	1	1	54.5	10	51.5	7.75	33	99.0	84.00	134	0	1	SM LV	WP DO
WILLISTON, NORTH DAKOTA																								
1980 513	61.2	33.3	75	41	1	1.93	13.3	2	63.3	0.53	14.4	1	2	63.5	6	53.5	5.33	3	133.0	88.09	186	2	4		
COTEAU	56.0	27.0	0	90	2	1.64	17.0	0	64.1	0.58	16.0	1	3	64.7	5	64.7	3.50	4	111.0	85.00	107	4	1	TW KW SM WM 3D	LG
OLAF	59.5	33.2	45	53	2	1.68	16.3	4	63.1	0.44	15.2	1	1	69.5	A	69.5	6.00	3	131.5	95.05	214	2	4	TW SN WM	

1/ CLEAN DRY - SURFACE & LB./BU. EQP PACKAGE-FREE T.W.

2/ 14% MOISTURE BASIS.

3/ 1 = VERY SATISFACTORY, 2 = SATISFACTORY, 3 = SATISFACTORY-QUESTIONABLE, 5 = QUESTIONABLE-SATISFACTORY, 6 = QUESTIONABLE-UNSATISFACTORY, 7 = UNSATISFACTORY-QUESTIONABLE, 9 = UNSATISFACTORY.

4/ 1 = NORMAL, 2 = NORMAL-SOFT, 3 = SOFT-NORMAL, 4 = SOFT, 5 = GRITTY, 6 = VERY SOFT.

5/ REFER TO REFERENCE MIXOGRAMS FOR VONSENTAL CURVE PATTERN. 11 = VERY WEAK --- 11 = VERY STRONG!

6/ 1 = QUICKY, 2 = VERY ELASTIC, 3 = ELASTIC, 4 = ELASTIC-PLIABLE, 5 = PLIABLE-ELASTIC, 6 = PLIABLE, 7 = PLIABLE-WEAK, 8 = WEAK-PLIABLE, 9 = WEAK, 10 = VERY WEAK, 20 = SLIGHTLY DEAD, 33 = DEAD.

7/ XXX.0 = BRIGHT WHITE, XXX.5 = WHITE, XXX.7 = SLIGHTLY CREAMY, XXX.8 = BRIGHT CREAMY, XXX.5 = CREAMY, XXX.1 = VERY CREAMY, XXX.3 = GRAY, XXX.2 = DULL GRAY, XXX.1 = VERY GRAY.

8/ XXX.03 = SIGHT, XXX.01 = THICK WALL OR WASH, XXX.33 = CLOSE, XXX.05 = OPEN, IRREGULAR, XXX.06 = OPEN,SLIGHTLY IRREGULAR, XXX.17 = IRREGULAR,OPEN, XXX.07 = OPEN, XXX.13 = LITTLEJLAG, XXX.31 = SLIGHTLY OPEN,IRREGULAR, XXX.50 = SLIGHTLY IRREGULAR,OPEN, XXX.70 = SLIGHTLY OPEN, XXX.00 = SLIGHTLY IRREGULAR, XXX.99 = NORMAL.

9/ 1 = NO PROMISE, 2 = LITTLE PROMISE, 3 = SOME PROMISE, 4 = GOOD PROMISE.

TABLE 8

QUALITY DATA OF FIELD PLOT NURSERY SAMPLES

1988 CROP

VARIETY OR SELECTION	T.W. 1/	1000 KWT.	KERNEL SIZE LG	MED	SM	WHT. MIM.	WHT. PRO.	KERN. CHAR.	FLR. RAT.	MIN.% ASHES	FLR. COL.	MLG. CHAR.	MLG. PER.	MIX. ABS.	MIX. RAT.	BAKE ABS.	MIX. TIME	DOUGH CHAR.	CRUMB COLOR	CRUMB GRAIN	LOAF VOL.	BAKE EVAL.	GEN. EVAL.	MINOR DEFICIENCY	MAJOR DEFICIENCY
	8/50.	G.	E	E	E	E	E	3/	E	2/	E	9/	3/	E	5/	E	MIN.	8/	EE.	8/	EE.	3/	9/		
WILLISTON, NORTH DAKOTA																									
ANGUS *	52.7	27.9	13	84	3	1.54	16.6	2	69.7	0.38	15.3	1	3	67.9	6	58.5	4.75	2	100.0	88.88	650	3	3	M65 LV	
BENITO	56.2	21.7	1	89	10	1.59	17.1	0	59.5	0.32	15.5	1	4	67.3	4	60.1	3.00	3	102.5	86.87	870	5	1	TW KW M65 OD	LG SM
BUTTE	63.4	25.3	7	89	4	1.57	16.5	3	69.1	0.35	15.5	1	2	73.1	6	73.9	4.88	3	101.5	85.87	955	4	3	KW LG 33 LV	
EDEAU	57.7	24.7	5	92	5	1.54	17.6	0	70.3	0.42	17.1	1	0	69.4	3	73.4	3.00	5	99.9	88.81	790	6	1	TW SW LV	LG M65 OD
ELLAR	59.5	28.6	23	75	2	1.63	14.5	2	67.9	0.18	11.1	1	1	67.9	7	54.9	4.58	3	100.7	86.89	900	4	3	WW M65 OD	
FRA	59.2	23.1	6	89	5	1.51	15.7	6	70.0	0.36	14.5	1	3	65.3	6	55.7	5.33	3	101.0	87.87	955	7	2	LG SW WP M65 30	OA
LEN	57.3	27.9	14	85	3	1.58	16.6	2	70.6	0.39	14.9	1	4	68.8	7	69.7	5.75	2	100.5	84.89	925	2	3	M65	
LEW	59.8	27.9	6	89	5	1.56	16.9	3	69.2	0.33	16.5	1	5	70.6	9	71.2	7.50	2	102.5	82.85	975	3	3	LG SW MT	M65
MARBERG	59.5	25.4	5	89	6	1.65	16.8	4	69.1	0.33	15.5	1	2	67.6	6	55.7	5.33	1	103.8	84.87	950	5	3	LG SW	OD
OLAF	59.3	30.1	27	71	1	1.68	15.7	2	66.5	0.18	15.2	1	2	66.3	7	67.5	5.25	1	100.8	91.87	930	5	3		33
PINGREE	61.9	25.7	2	93	5	1.48	16.2	0	73.0	0.37	15.6	1	2	53.6	7	73.5	4.75	1	105.0	88.89	1310	4	1	SW	LG OD
PROSPERITY #11	60.3	27.6	7	87	6	1.55	15.4	6	71.0	0.46	14.7	1	4	66.5	7	67.4	6.50	E	101.0	84.89	980	2	3	LG SW WP	M65
SOLAR	59.3	24.2	5	89	6	1.56	15.9	5	70.3	0.35	14.5	1	3	62.5	5	63.2	4.75	E	101.0	87.89	950	0	1	KW LG SW M65	OA
TIOGA	58.4	23.2	11	87	2	1.61	17.4	3	68.9	0.39	16.5	1	4	65.3	5	66.6	3.75	3	102.0	85.89	1015	6	2	M65 OA OD	M65 OA
WALDRON	58.1	26.7	8	93	2	1.55	17.3	3	69.2	0.43	18.3	1	4	65.3	8	66.3	4.58	A	99.0	86.87	990	7	1	LG OD	
KALERA	59.2	25.8	7	89	4	1.48	15.9	5	69.8	0.39	14.7	1	4	62.8	5	63.5	4.25	3	100.0	89.88	960	8	1	LG M65 OD	OA
ND 550	63.5	25.5	2	92	6	1.49	16.7	0	68.4	0.38	16.1	1	3	68.6	7	67.5	5.25	2	101.8	88.88	940	2	1	SW M65	LG
ND 565	58.9	26.3	9	91	5	1.55	16.3	4	67.5	0.32	15.4	1	4	67.6	5	68.5	3.50	4	100.7	84.89	965	0	1	SW M65	LG OD
ND 572	59.8	29.6	7	90	3	1.54	16.4	3	67.7	0.36	15.7	1	2	66.3	6	57.3	4.33	A	100.7	84.85	955	4	3	LG OD	
ND 573	61.4	25.8	5	90	5	1.61	15.8	5	67.2	0.35	15.1	1	3	67.3	6	65.1	3.25	3	101.8	88.89	950	6	3	LG SW OD	
ND 577	63.3	27.2	9	92	4	1.61	16.2	3	67.7	0.37	15.3	1	3	65.2	7	63.2	5.75	2	100.5	88.85	990	2	4		LG
SJ 20	58.5	24.8	4	92	4	1.51	17.9	4	69.2	0.36	15.3	1	4	66.8	8	69.9	3.75	3	100.5	85.89	860	4	2	OD	LG PD
WPB 986 R	66.6	32.9	46	53	1	1.57	16.1	2	66.2	0.37	15.7	1	3	66.7	8	65.6	4.58	3	103.8	86.89	1025	7	2	OD	OA

1/ CLEAN DRY - SUBTRACT 1 LB./BU. FOR DOCKAGE-FREE T.W.

2/ 14% MOISTURE BASIS.

3/ 1 = VERY SATISFACTORY, 2 = SATISFACTORY, 3 = SATISFACTORY-QUESTIONABLE, 4 = QUESTIONABLE-SATISFACTORY, 5 = QUESTIONABLE, 6 = QUESTIONABLE-UNSATISFACTORY, 7 = UNSATISFACTORY-QUESTIONABLE, 8 = UNSATISFACTORY.

4/ 1 = NORMAL, 2 = NORMAL-SOFT, 3 = SOFT-NORMAL, 4 = SOFT, 5 = GRITTY, 6 = VERY SOFT.

5/ REFER TO REFERENCE MIXOGRAMS FOR NUMERICAL CURVE PATTERN. 11 = VERY WEAK --- 11 = VERY STRONG!

6/ 1 = BUCKY, 2 = VERY ELASTIC, 3 = ELASTIC, 4 = ELASTIC-PLIABLE, 5 = PLIABLE-ELASTIC, 6 = PLIABLE, 7 = PLIABLE-WEAK, 8 = WEAK-PLIABLE, 9 = WEAK, 10 = VERY WEAK, 20 = SLIGHTLY DEAD, 33 = DEAD.

7/ XXX.9 = BRIGHT WHITE, XXX.8 = WHITE, XXX.7 = SLIGHTLY CREAMY, XXX.6 = BRIGHT CREAMY, XXX.5 = CREAMY, XXX.4 = VERY CREAMY, XXX.3 = GRAY, XXX.2 = DULL GRAY, XXX.1 = VERY GRAY.

8/ XXX.88 = SOGGY, XXX.81 = THICK WALL OR HARSH, XXX.33 = CLOSE, XXX.05 = OPEN, IRREGULAR, XXX.00 = OPEN-SLIGHTLY IRREGULAR, XXX.37 = IRREGULAR-OPEN, XXX.89 = OPEN, XXX.10 = IRREGULAR, XXX.33 = SLIGHTLY OPEN-IRREGULAR, XXX.56 = SLIGHTLY IRREGULAR-OPEN, XXX.70 = SLIGHTLY OPEN, XXX.33 = SLIGHTLY IRREGULAR, XXX.99 = NORMAL.

9/ 1 = NO PROMISE, 2 = LITTLE PROMISE, 3 = SOME PROMISE, 4 = GOOD PROMISE.

TABLE 9

QUALITY DATA OF FIELD PLOT NURSERY SAMPLES

1980 CROP

VARIETY OR SEL. NO.	T.W. 1/	1000 KWT.	KERNEL SIZE LG	MED	SM	WHT. MIN.	WHT. PRO.	KERN. CHAR.	FLR. EXT.	MIN.B ASHER.	FLR. PRO.	MLG CHAR.	MLD. PER.	MIX. ABS.	MIX. PAT.	BAKE ABS.	MIX. TIME	DOUGH CHAR.	CRUMB COLOR	CRUMB GRAIN	LOAF VOL.	BAKE EVAL.	GEN. EVAL.	MINOR DEFICIENCY	MAJOR DEFICIENCY
	%MB.	G.	%	%	%	%	%	%	%	%	%	%	%	%	%	%	MIN.	%	%	%	CC.	%	%		
MESA,ARIZONA																									
CAJEME 171	63.8	42.9	60	29	3	1.37	13.6	2	73.2	0.34	13.2	1	2	66.3	6	67.0	4.25	4	131.0	86.07	675	2	4		
PIOBRAND 771	62.1	37.7	50	47	3	1.35	12.6	6	72.5	0.29	11.9	2	1	63.5	6	54.5	4.53	5	131.0	86.03	695	6	1	KW WP DO	DA
C78-4	62.0	40.2	52	37	6	1.30	12.1	6	69.4	0.39	11.3	1	3	64.2	5	59.7	4.50	5	132.5	86.03	800	7	1	DO LV	WP BA
C78-235	64.3	37.0	54	43	3	1.24	11.6	6	70.4	0.32	10.7	1	3	65.0	3	65.7	2.25	6	130.0	85.01	705	6	1	KW	WP 34 DO LV
81-E	62.2	41.2	55	31	3	1.20	12.0	5	69.7	0.36	11.1	1	6	62.5	5	56.3	3.53	5	131.0	84.09	800	8	1	EX MAS DO LV	WP BA
231	63.6	33.9	35	59	6	1.37	12.4	7	68.8	0.35	11.9	1	6	65.3	4	66.4	2.75	6	130.0	87.03	935	6	1	KW KW LO SM WP 34	EX 30
225	63.6	41.2	59	38	3	1.26	12.4	5	68.2	0.34	11.9	1	8	63.5	6	65.5	4.25	5	131.8	87.05	790	0	1	WP DO LV	EX BA

1/ CLEAN DRY - SUBTRACT 1 LB./BU. FOR PACKAGE-FREE T.W.
2/ 14% MOISTURE BASIS.
3/ 1 = VERY SATISFACTORY. 2 = SATISFACTORY. 3 = SATISFACTORY-QUESTIONABLE. 4 = QUESTIONABLE-SATISFACTORY. 5 = QUESTIONABLE. 6 = QUESTIONABLE-UNSATISFACTORY. 7 = UNSATISFACTORY-QUESTIONABLE. 8 = UNSATISFACTORY.
4/ 1 = NORMAL. 2 = NORMAL-SOFT. 3 = SOFT-NORMAL. 4 = SOFT. 5 = GRITTY. 6 = VERY SOFT.
5/ REFER TO REFERENCE DIAGRAMS FOR NUMERICAL CURVE PATTERN. II = VERY WEAK --- II = VERY STRONG!
6/ 1 = BUCKY. 2 = VERY ELASTIC. 3 = ELASTIC. 4 = ELASTIC-PLIABLE. 5 = PLIABLE-ELASTIC. 6 = PLIABLE. 7 = PLIABLE-WEAK. 8 = WEAK-PLIABLE. 9 = WEAK. 10 = VERY WEAK. 20 = SLIGHTLY DEAD. 30 = DEAD.
7/ XXX.0 = BRIGHT WHITE. XXX.6 = WHITE. XXX.7 = SLIGHTLY CREAMY. XXX.8 = BRIGHT CREAMY. XXX.5 = CREAMY. XXX.4 = VERY CREAMY. XXX.3 = DRAY. XXX.2 = DULL GRAY. XXX.1 = VERY GRAY.
8/ XXX.00 = STOCKY. XXX.01 = THICK WALL OR NARROW. XXX.03 = CLOSE. XXX.05 = OPEN. IRREGULAR. XXX.06 = OPEN,SLIGHTLY IRREGULAR. XXX.10 = IRREGULAR.OPEN. XXX.33 = OPEN. XXX.10 = IRREGULAR. XXX.33 = SLIGHTLY OPEN,IRREGULAR. XXX.50 = SLIGHTLY IRREGULAR,OPEN. XXX.70 = SLIGHTLY OPEN. XXX.90 = SLIGHTLY IRREGULAR. XXX.99 = NORMAL.
9/ 1 = NO PROMISE. 2 = LITTLE PROMISE. 3 = SOME PROMISE. 4 = GOOD PROMISE.

TABLE 10

QUALITY DATA OF INTERNATIONAL SPRING WHEAT NURSERY SAMPLES

1990 CROP

VARIETY OR SEL. NO.	T.W.	1000 KWT.	KERNEL SIZE LG	MED	SM	WHT. MILL.	WHT. PASS.	KERN. CHAR.	FLR. EXT.	MIN.@ 65%EXT.	FLR. PROT.	MLG CHAR.	MLG. PER.	MIX. ABS.	MIX. PAT.	BAKE ABS.	MIX. TIME	DOUGH CHAR.	CRUMB COLOR	CRUMB GRAIN	LOAF VOL.	BAKE EVAL.	GEN. EVAL.	MINOR DEFICIENCY	MAJOR DEFICIENCY
	1/ LB.	G.	%	%	%	%	%	2/	%	%	%	3/	3/	%	%	%	MIN.	4/	5/	6/	CC.	3/	%		
BOZEMAN, MONTANA																									
CHRIS	61.5	31.8	32	66	2	1.46	15.2	3	61.9	0.45	14.9	1	3	55.3	4	56.3	3.00	8	132.0	66.99	168	2	4	KW LG LW	
FORTUNA	61.0	42.6	62	35	3	1.49	14.3	2	65.1	0.39	14.1	1	1	62.8	2	62.8	2.75	5	131.6	69.99	173	2	4		
LEE	62.5	37.2	56	41	3	1.56	16.5	2	63.2	0.48	14.3	1	2	64.2	5	64.2	4.06	4	132.0	80.69	168	5	3	MI DD	
THATCHER	59.3	33.1	46	50	2	1.57	14.0	4	61.1	0.51	14.4	1	2	61.9	2	63.5	2.50	5	103.6	99.99	176	2	1	LW KW	M65
TIOGA	52.9	40.6	66	15	2	1.58	14.3	2	61.4	0.42	14.1	1	2	64.2	3	64.2	2.75	5	134.9	87.09	191	2	4		
WALDRON	59.5	37.0	72	26	2	1.57	14.9	3	61.0	0.45	14.3	1	5	64.2	3	61.2	3.25	5	132.3	95.03	164	2	3	W65	
MT 783	62.3	35.8	52	48	2	1.54	14.7	2	60.2	0.44	13.0	1	3	64.2	4	58.2	4.33	8	103.8	85.09	174	4	3	KW MT	
MT 7628	62.6	34.0	23	75	2	1.40	15.6	3	60.1	0.41	14.8	1	3	64.7	5	64.7	4.50	5	132.3	85.69	189	4	3	KW LG DD MT	
MT 7616	63.3	36.9	41	57	2	1.50	13.8	5	64.1	0.33	12.9	1	1	61.7	3	64.7	5.06	3	103.8	83.65	166	4	3	WP MT	
MT 7619	62.6	39.2	50	45	2	1.43	17.9	4	64.7	0.43	12.2	1	2	61.9	7	51.9	6.53	8	103.6	86.69	178	8	1	DA	WP MT
MT 7925	62.5	35.8	47	50	3	1.46	13.1	6	66.5	0.43	12.1	1	4	61.3	2	61.9	3.00	7	134.8	87.09	158	7	1	D3 DA DD	WP
MD 533	63.5	41.5	81	19	0	1.38	13.8	3	68.8	0.41	13.6	1	2	63.5	2	63.5	3.00	7	133.5	55.09	185	5	3	DD LV	
MT 781	60.5	41.5	57	31	2	1.49	14.4	2	59.3	0.48	14.2	1	4	64.2	4	64.2	4.00	5	133.8	88.09	191	4	2	FK MT	
SJ 201	60.5	31.6	37	63	0	1.45	14.4	3	62.4	0.42	14.2	1	2	64.4	3	64.4	3.06	6	132.8	66.05	174	2	4	KW LG	

1/ CLEAN DRY - SUBTRACT 1 LB./BU. FOR DOCKAGE-FREE T.W.

2/ IAE MOISTURE BASIS.

3/ 1 = VERY SATISFACTORY, 2 = SATISFACTORY, 3 = SATISFACTORY-QUESTIONABLE, 4 = QUESTIONABLE-SATISFACTORY, 5 = QUESTIONABLE, 6 = QUESTIONABLE-UNSATISFACTORY, 7 = UNSATISFACTORY-QUESTIONABLE, 8 = UNSATISFACTORY.

4/ 1 = NORMAL, 2 = NORMAL-SOFT, 3 = SOFT-NORMAL, 4 = SOFT, 5 = GRITTY, 6 = VERY SOFT.

5/ REFER TO REFERENCE MICROGRAMS FOR NUMERICAL CURVE PATTERN. 11 = VERY WEAK --- 11 = VERY STRONG.

6/ 1 = BUCKY, 2 = VERY ELASTIC, 3 = ELASTIC, 4 = ELASTIC-PLIABLE, 5 = PLIABLE-ELASTIC, 6 = PLIABLE, 7 = PLIABLE-WEAK, 8 = WEAK-PLIABLE, 9 = WEAK, 10 = VERY WEAK, 29.= SLIGHTLY DEAD, 30 = DEAD.

7/ XXX.9 = BRIGHT WHITE, XXX.8 = WHITE, XXX.7 = SLIGHTLY CREAMY, XXX.6 = BRIGHT CREAMY, XXX.5 = CREAMY, XXX.4 = VERY CREAMY, XXX.3 = GRAY, XXX.2 = DULL GRAY, XXX.1 = VERY GRAY.

8/ XXX.60 = SOGGY, XXX.01 = THICK WALL OR HARSH, XXX.33 = CLOSE, XXX.34 = OPEN, IRREGULAR, XXX.36 = OPEN, SLIGHTLY IRREGULAR, XXX.37 = IRREGULAR, OPEN, XXX.69 = OPEN, XXX.16 = IRREGULAR, XXX.36 = SLIGHTLY OPEN, IRREGULAR, XXX.59 = SLIGHTLY IRREGULAR, OPEN, XXX.70 = SLIGHTLY OPEN, XXX.30 = SLIGHTLY IRREGULAR, XXX.99 = NORMAL.

9/ 1 = NO PROMISE, 2 = LITTLE PROMISE, 3 = SOME PROMISE, 4 = GOOD PROMISE.

TABLE II

QUALITY DATA OF INTERNATIONAL SAWFLY NURSERY SAMPLES

1986 CROP

VARIETY OR SELN. NO.	T.W. 1/	1000 KNT. g	KERNEL LG %	KERNEL MED %	KERNEL SM %	WHT. VIN. %	WHT. PAT. %	VERN. CHAR. %	FLR. MIN.B FAR. %	FLR. MIN.B GRAIN %	FLR. MLG CHAR. %	FLR. %LG. DEF. %	MIX. ABS. %	MIX. PAT. %	BAKE ABS. %	MIX. TIME MIN.	DOUGH CHAR. %	CRUMB COLOR %	CRUMB GRAIN %	LOAF VOL. CC.	BAKE EVAL. %	GEN. EVAL. %	MINOR DEFICIENCY	MAJOR DEFICIENCY
HAVRE, MONTANA																								
CAMUS	61.0	25.6	6	66	5	1.45	16.5	4	59.7	0.47	16.2	1	2	65.3	4	39.3	3.25	A	131.7	88.69	196	5	3	MW SM RO	LG
FJORTUNA	62.3	30.9	44	54	2	1.55	16.3	2	59.1	0.46	16.1	1	3	66.3	4	66.3	3.15	3	132.6	88.69	214	2	4		RA
LEX	62.0	30.3	14	62	4	1.52	15.0	4	56.1	0.53	13.1	1	4	63.2	6	63.2	5.25	3	133.6	56.05	213	5	2	LG X69	
THATCHER	61.5	26.3	13	64	3	1.56	16.5	4	56.5	0.41	16.2	1	3	63.9	3	63.8	3.06	3	106.6	06.03	209	4	3	MW LG RA	
ELOSA	61.6	33.2	34	64	2	1.58	16.5	2	58.8	0.44	16.1	1	2	66.3	5	66.3	4.00	3	106A.7	87.05	209	2	4		
44L6ROM	61.3	32.4	43	52	2	1.59	16.3	3	56.3	0.37	15.9	1	3	33.5	3	66.3	3.75	3	103.0	95.63	219	2	4		
MT 763	61.5	28.6	10	55	5	1.51	16.6	4	57.1	0.56	14.5	1	6	64.7	7	54.1	3.75	4	109.0	81.63	230	6	1	Kd SM M65 PO MT OO	LG
MT 7620	59.3	28.5	6	66	6	1.53	16.5	8	35.3	0.43	16.3	1	6	67.6	6	67.0	5.25	3	133.6	84.05	217	2	1	TW MW SM	LO E4
MT 7518	62.5	28.6	6	68	4	1.62	15.9	6	59.5	0.52	15.2	1	9	64.6	7	66.6	5.15	3	133.6	85.03	215	3	1	KW M3	LG M35
MT 7819	60.7	33.3	20	70	1	1.59	14.9	3	61.1	0.49	15.2	1	3	64.1	11	34.1	16.53	3	132.6	83.96	196	6	1	LG X69	MT
MT 7626	63.6	26.6	13	86	1	1.47	15.1	6	66.6	0.42	13.3	1	1	68.3	6	66.3	4.56	3	106.6	85.86	235	2	4	KW LG WP	
ND 531	61.3	33.1	33	61	5	1.52	16.4	2	59.3	0.42	16.2	1	2	63.3	5	65.3	4.06	3	133.0	66.65	203	2	4		E4
MT 701	61.5	32.6	34	63	3	1.45	15.4	4	55.0	0.48	14.5	2	6	64.1	5	64.1	A.25	3	101.0	66.06	224	2	3	WP	
SU 251	61.5	29.5	34	66	0	1.50	17.6	2	59.6	0.45	16.6	1	2	65.3	4	66.3	3.66	4	132.6	86.07	190	5	3	KW OO LV	

1/ CLEAN DRY - SUBJECT TO 13.5/60. FOR DOCKAGE-FREE T.W.

2/ 14% MOISTURE BASIS.

3/ 1 = VERY SATISFACTORY, 2 = SATISFACTORY, 3 = SATISFACTORY-OBJECTIONABLE, 4 = OBJECTIONABLE-SATISFACTORY, 5 = OBJECTIONABLE, 6 = OBJECTIONABLE-UNSATISFACTORY, 7 = UNSATISFACTORY-OBJECTIONABLE, 8 = UNSATISFACTORY.

4/ 1 = NORMAL, 2 = NORMAL-SOFT, 3 = SOFT-NORMAL, 4 = SOFT, 5 = GRITTY, 6 = VERY SOFT.

5/ REFER TO REFERENCE NOMOGRAMS FOR NUMERICAL CURVE PATTERN. (1 = VERY WEAK --- 11 = VERY STRONG)

6/ 1 = BUCKY, 2 = VERY ELASTIC, 3 = ELASTIC, 4 = ELASTIC-PLIABLE, 5 = PLIABLE-ELASTIC, 6 = PLIABLE, 7 = PLIABLE-WEAK, 8 = WEAK-PLIABLE, 9 = WEAK, 10 = VERY WEAK, 20.= SLIGHTLY DEAD, 30 = DEAD.

7/ XXX.6 = BRIGHT WHITE, XX4.0 = WHITE, XX4.7 = SLIGHTLY CREAMY, XXX.6 = BRIGHT CREAMY, XXX.5 = CREAMY, XX4.4 = VERY CREAMY, XX7.3 = GRAY, XX4.2 = DULL GRAY, XXX.1 = VERY GRAY.

8/ XXX.09 = SOGGY, XXX.01 = THICK WALL OR HARSH, XXX.33 = CLOSE, XXX.65 = OPEN, IRREGULAR, XXX.06 = OPEN,SLIGHTLY IRREGULAR, XXX.97 = IRREGULAR,OPEN, XXX.30 = OPEN, XX4.10 = IRREGULAR, XX4.38 = SLIGHTLY OPEN, IRREGULAR, XX4.55 = SLIGHTLY IRREGULAR,OPEN, XXX.76 = SLIGHTLY OPEN, XXX.96 = SLIGHTLY IRREGULAR, XXX.60 = NORMAL.

9/ 1 = NO PROMISE, 2 = LITTLE PROMISE, 3 = SOME PROMISE, 4 = GOOD PROMISE.

TABLE 12

QUALITY DATA OF INTERNATIONAL SAWFLY NURSERY SAMPLES

1980 CROP

VARIETY OR SEL. NO.	T.W. 1/	1000 KWT.	KERNEL SIZE LG	KERNEL SIZE MED	KERNEL SIZE SM	WHT. MIN.	WHT. PRO.	KERN. CHAR.	FLR. EXT.	MIN.% ASHER.	FLR. PRT.	MLG CHAR.	MLG PER.	MIX. ABS.	MIX. PAT.	BAKE ABS.	MIX. TIME	DOUGH CHAR.	CRUMB COLOR	CRUMB GRAIN	LOAF VOL.	BAKE EVAL.	GEN. EVAL.	MINOR DEFICIENCY	MAJOR DEFICIENCY
	8/60	G.	%	%	%	%	%	%	%	%	%	%	%	%	%	%	MIN.	%	%	%	CC.	%	%		
MINOT, NORTH DAKOTA																									
CN119	58.5	27.2	11	84	5	1.41	14.2	3	61.1	0.32	17.0	1	1	65.7	6	65.1	4.50	3	132.8	86.03	201	3	4	KW LG PD	
FORTUNA	59.0	31.8	24	71	5	1.42	11.5	2	60.2	0.42	17.1	1	2	66.1	6	64.7	5.15	3	132.8	85.09	215	2	4		
LEV	39.3	31.3	10	78	4	1.30	16.4	4	59.7	0.44	15.7	1	3	63.5	9	63.5	7.25	3	132.8	85.05	226	4	3	WP DA	
THATCHER	57.0	21.0	9	88	3	1.44	17.4	4	63.2	0.44	17.1	1	3	66.4	5	64.6	6.25	3	132.8	84.09	208	2	4	KW LG	
11064	58.8	33.1	20	77	3	1.45	17.8	2	59.9	0.41	16.9	1	2	65.1	6	65.3	5.50	3	134.8	86.09	216	2	4		
WALDRON	55.5	32.5	61	56	3	1.49	17.7	2	59.5	0.43	17.1	1	3	67.0	6	67.0	5.15	3	133.8	85.07	199	2	4		
MT 703	60.0	29.9	11	85	4	1.34	16.3	5	58.2	0.44	15.3	1	4	63.2	9	63.2	8.25	3	134.9	81.09	220	5	2	KW LG WP BA MT	
MT 1620	57.0	31.7	11	85	4	1.41	17.5	4	59.4	0.41	17.3	1	3	67.3	7	67.9	6.25	3	132.8	85.09	217	2	4	LG	
MT 7610	58.9	35.0	33	54	3	1.37	16.0	7	57.8	0.46	16.2	1	5	66.2	7	64.2	6.00	1	104.9	83.03	226	2	3	M83	
MT 7619	57.7	31.9	12	84	4	1.40	15.3	6	63.9	0.46	14.3	1	4	61.0	11	61.0	15.00	1	102.3	86.01	212	8	1	LG M65	WP BA MT
MT 1926	59.3	23.2	11	55	4	1.21	15.4	6	62.5	0.39	14.0	1	1	61.9	7	51.9	5.25	4	101.0	87.10	208	8	1	KW LG DD	WP 84
ND 000	58.0	34.4	51	46	3	1.43	11.0	2	61.5	0.32	15.1	1	1	66.4	8	64.4	6.50	3	131.9	86.05	206	2	4		
MT 810	58.0	29.7	7	89	4	1.40	17.4	4	59.0	0.47	16.0	1	6	67.9	10	61.9	9.15	3	133.0	81.09	240	3	1	KW MT	LG N53
SV 28 SIB-1	58.5	37.6	23	72	3	1.32	10.5	2	62.1	0.43	18.0	1	2	67.9	6	61.9	5.25	3	101.8	89.99	199	2	4		

1/ CLEAN DRY - SUBTRACT 1 LB./BU. FOR DOCKAGE-FREE T.W.

2/ 14% MOISTURE BASIS.

3/ 1 = VERY SATISFACTORY, 2 = SATISFACTORY, 3 = SATISFACTORY-QUESTIONABLE, 4 = QUESTIONABLE-SATISFACTORY, 5 = QUESTIONABLE, 6 = QUESTIONABLE-UNSATISFACTORY, 7 = UNSATISFACTORY-QUESTIONABLE, 8 = UNSATISFACTORY.

4/ 1 = NORMAL, 2 = NORMAL-SOFT, 3 = SOFT-NORMAL, 4 = SOFT, 5 = GRITTY, 6 = VERY SOFT.

5/ REFER TO DIFFERENCE MIDGRAMS FOR NUMERICAL CURVE PATTERN; 11 = VERY WEAK --- 11 = VERY STRONG!

6/ 1 = BUCKY, 2 = VERY ELASTIC, 3 = ELASTIC, 4 = ELASTIC-PLIABLE, 5 = PLIABLE-ELASTIC, 6 = PLIABLE, 7 = PLIABLE-WEAK, 8 = WEAK-PLIABLE, 9 = WEAK, 10 = VERY WEAK, 20 = SLIGHTLY DEAD, 30 = DEAD.

7/ XXX.0 = BRIGHT WHITE, XXX.5 = WHITE, XXX.7 = SLIGHTLY CREAMY, XXX.8 = BRIGHT CREAMY, XXX.9 = CREAMY, XXX.4 = VERY CREAMY, XXX.3 = GRAY, XXX.2 = DULL GRAY, XXX.1 = VERY GRAY.

8/ XXX.03 = SOGGY, XXX.04 = THICK WALL OR HARSH, XXX.03 = CLOSE, XXX.05 = OPEN, IRREGULAR, XXX.06 = OPEN,SLIGHTLY IRREGULAR, XXX.37 = IRREGULAR,OPEN, XXX.09 = OPEN, XXX.10 = IRREGULAR, XXX.30 = SLIGHTLY OPEN,IRREGULAR, XXX.50 = SLIGHTLY IRREGULAR,OPEN, XXX.70 = SLIGHTLY OPEN, XXX.90 = SLIGHTLY IRREGULAR, XXX.99 = NORMAL.

9/ 1 = NO PROMISE, 2 = LITTLE PROMISE, 3 = SOME PROMISE, 4 = GOOD PROMISE.

TABLE 13

QUALITY DATA OF INTERNATIONAL SAMPLE NURSERY SAMPLES

1990 CROP

VARIETY OR DEL. NO.	T.W. 1/ #/BU.	1000 KWT. G.	KERNEL SIZE LG %	MED %	SM %	WHT. MIX. 2/ %	WHT. PRO. 2/ %	AFRN. CHAR. 3/	FLR. EXT. %	MIX.B. BAKER. 4/	FLR. PRO. %	MLG. CHAR. 5/	MLG. PER. 3/	MIA. ABS. 2/ %	MIA. PAT. 3/ %	DAAE ABS. 2/ %	MIA. TIME MIN.	DOUGH CHAR. 6/	CRUMB COLOR 7/	CRUMB GRAIN 8/	LOAF VOL. 9/	BAKE EVAL. 3/	GEN. EVAL. 9/	MINOR DEFICIENCY	MAJOR DEFICIENCY
WILLISTON, NORTH DAKOTA																									
CHRIS	57.5	25.0	10	06	4	1.63	17.3	4	62.1	0.42	16.4	1	2	67.3	5	67.9	4.50	3	102.0	00.07	205	2	4	KW LG	
FORTUNA	58.5	36.4	39	50	2	1.75	17.9	2	62.2	0.59	16.3	1	9	67.3	5	67.3	3.75	3	101.0	00.07	196	2	1		MGS
LEW	60.0	31.7	17	51	2	1.72	16.4	4	62.1	0.30	15.6	1	3	66.0	0	65.6	7.75	3	103.0	05.07	210	0	1	MGS	WT
THATCHER	55.0	24.0	10	05	5	1.70	17.4	4	62.5	0.33	15.9	1	1	65.7	4	65.7	3.00	4	101.5	08.09	107	4	3	KW LG	DO
TIOGA	54.0	31.4	22	76	2	1.72	17.0	2	60.0	0.45	16.7	1	2	65.7	5	65.7	4.33	3	102.0	05.07	213	2	4		
WALDRON	58.0	30.0	36	64	2	1.79	17.5	2	00.5	0.53	10.5	1	2	04.2	5	64.2	4.75	3	102.0	07.07	230	4	3	RA	
MT 703	55.0	26.5	0	07	5	1.59	16.4	5	59.0	0.34	15.1	1	4	64.7	7	64.7	6.03	3	103.0	05.05	216	6	2	KW DA WT	LG
MT 7020	58.0	20.0	5	00	0	1.71	17.4	4	60.9	0.40	17.1	1	3	02.4	0	60.4	5.75	3	102.0	07.00	220	3	3	SW EX WT	LG
MT 7010	55.5	21.1	4	09	7	1.75	15.3	3	03.1	0.35	15.2	1	5	07.0	7	67.9	6.50	3	102.0	09.00	223	3	1	KW SW WT	LG MGS
MT 7919	56.5	28.9	13	84	3	1.75	15.9	4	02.1	0.49	14.9	1	2	65.3	11	65.3	14.25	3	102.5	00.09	213	0	4	TW LG DO	MT
MT 7926	01.0	29.9	10	80	4	1.59	15.7	5	60.4	0.45	14.7	1	2	65.3	6	65.3	5.25	3	103.0	00.05	215	2	4	LG WP	
ND 591	51.5	31.4	47	51	2	1.60	16.9	2	01.3	0.44	16.4	1	1	65.9	6	60.5	5.75	3	102.5	00.07	206	3	4	WT	
BUTTE	53.3	27.5	13	80	3	1.70	17.0	3	63.0	0.49	16.1	1	1	60.5	5	53.9	3.75	3	101.0	07.07	202	E	4	KW LG	
OLAF	50.0	32.2	40	59	1	1.69	15.9	2	50.7	0.45	15.3	1	2	65.7	7	65.7	6.75	3	100.0	06.05	219	3	4	WT	
MT 781	53.3	33.4	22	75	3	1.66	16.2	4	57.8	0.34	15.4	1	6	65.7	5	65.7	4.75	4	102.0	07.05	211	4	2	WP DO	EA
SU 2895 1107	58.0	27.0	21	77	2	1.81	15.3	2	61.6	0.49	17.7	1	2	68.5	5	68.5	3.75	3	101.5	02.05	197	2	4	KW	

1/ CLEAN DRY - SUBTRACT 1 LB./BU. FOR DOCKAGE-FREE T.W.

2/ 14% MOISTURE BASIS.

3/ 1 = VERY SATISFACTORY, 2 = SATISFACTORY, 3 = SATISFACTORY-QUESTIONABLE, 4 = QUESTIONABLE, 5 = QUESTIONABLE-UNSATISFACTORY, 6 = UNSATISFACTORY.

4/ 1 = NORMAL, 2 = NORMAL-SOFT, 3 = SOFT-NORMAL, 4 = SOFT, 5 = GRITTY, 6 = VERY SOFT.

5/ REFER TO REFERENCE MIXOGRAMS FOR NUMERICAL CURVE PATTERN. (1 = VERY WEAK --- 11 = VERY STRONG)

6/ 1 = BUCKY, 2 = VERY ELASTIC, 3 = ELASTIC, 4 = ELASTIC-PLIABLE, 5 = PLIABLE-ELASTIC, 6 = PLIABLE, 7 = PLIABLE-WEAK, 8 = WEAK-PLIABLE, 9 = WEAK, 10 = VERY WEAK, 20 = SLIGHTLY DEAD, 30 = DEAD.

7/ XXX.9 = BRIGHT WHITE, XXX.8 = WHITE, XXX.7 = SLIGHTLY CREAMY, XXX.6 = BRIGHT CREAMY, XXX.5 = CREAMY, XXX.4 = VERY CREAMY, XXX.3 = GRAY, XXX.2 = DULL GRAY, XXX.1 = VERY GRAY.

8/ XXX.03 = SOFT, XXX.01 = THICK WALL OR HARSH, XXX.03 = CLOSE, XXX.05 = OPEN, IRREGULAR, XXX.95 = OPEN, SLIGHTLY IRREGULAR, XXX.07 = IRREGULAR, OPEN, XXX.90 = OPEN, XXX.10 = IRREGULAR, XXX.30 = SLIGHTLY OPEN, IRREGULAR, XXX.50 = SLIGHTLY IRREGULAR, OPEN, XXX.13 = SLIGHTLY OPEN, XXX.03 = SLIGHTLY IRREGULAR, XXX.99 = NORMAL.

9/ 1 = NO PROMISE, 2 = LITTLE PROMISE, 3 = SOME PROMISE, 4 = GOOD PROMISE.

TABLE 14

QUALITY DATA OF INTERNATIONAL SAWFLY VARIETY SAMPLES

1989 CROP

VARIETY OR SEL. NO.	T.W. g/100	1982 KWS.	KERNEL SIZE LG	MED	SM	WHT. MIN. %	WHT. PRO. %	KERN. CHAR. %	FLR. EXT. %	MIN.B 65%EX. %	FLR. ??3. %	NLG CN4. %	NLG. PER. %	MIX. 45S. %	MIX. A4T. %	BAKE ABS. %	MIX. TIME MIN.	DOUGH CHAR. %	CRUMB COLOUR %	CRUMB GRAIN %	LOAF VOL. CC	BAKE EVAL. %	GEN. EVAL. %	MINOR DEFICIENCY	MAJOR DEFICIENCY
VARIETY AVERAGES																									
CASIS	50.6	27.7	15	81	4	1.47	16.5	4	61.2	0.45	16.2	1	2	66.2	5	55.2	3.75	4	178.8	86.86	192	4	5	KW LG DD	
FJ31U44	60.1	35.2	47	55	3	1.55	16.3	2	51.7	0.47	15.9	1	3	65.3	4	65.3	4.00	3	132.0	87.86	200	2	4		
LEW	61.0	33.1	26	71	3	1.31	15.8	3	60.9	0.48	15.1	1	3	64.X	7	64.4	6.00	3	102.0	86.85	238	3	3	NI	
MATCHER	58.9	28.1	23	77	3	1.55	16.5	4	60.7	0.48	16.1	1	3	64.4	4	54.4	3.25	4	132.0	87.09	195	4	3	KW LG DD	
10064	59.8	34.4	34	64	2	1.50	16.2	2	59.0	0.44	15.9	1	2	65.1	5	65.4	4.00	3	134.6	86.85	207	2	4		
WALDRON	59.1	33.0	48	50	2	1.61	16.6	2	59.6	0.47	16.0	1	3	65.4	5	55.4	X.25	2	102.0	86.85	232	2	4		
MT 763	60.4	29.8	20	76	4	1.49	15.9	5	58.0	0.48	15.7	1	4	64.2	7	64.2	6.00	4	105.0	86.85	232	5	2	KW SM EX	
MT 7628	59.0	30.7	12	83	5	1.51	16.8	4	58.2	0.45	15.4	1	4	67.0	6	67.0	5.50	3	133.0	85.86	212	2	3	LG 465 MT	LG
MT 7618	59.5	31.0	21	75	4	1.56	15.8	3	60.4	0.49	15.1	1	3	66.1	7	55.1	5.75	3	135.0	86.85	213	3	3	LG BA DD	MT
MT 7619	59.8	32.3	24	73	3	1.54	15.1	6	61.7	0.47	14.2	1	2	63.7	10	61.2	11.50	4	102.7	86.10	199	A	1	WP BA DD	WP
MT 7725	61.5	31.3	22	75	3	1.42	14.8	6	61.8	0.43	14.5	1	2	63.5	5	63.5	4.50	4	133.0	85.85	199	5	3	L2 BA DD	
ND 588	59.3	35.1	55	41	1	1.46	16.0	2	61.0	0.42	15.7	1	2	65.4	5	65.4	5.00	4	132.0	87.86	195	4	5	DD	

1/ CLEAN DRY - SUBTRACT 1 LB./BU. FOR DOCKAGE-FREE T.W.

2/ 1KS NOLSTJRE BASIS.

3/ 1 = VERY SATISFACTORY. 2 = SATISFACTORY. 3 = SATISFACTORY-QUESTIONABLE. 4 = QUESTIONABLE. 5 = QUESTIONABLE-UNSATISFACTORY. 7 = UNSATISFACTORY-QUESTIONABLE. 8 = UNSATISFACTORY.

4/ 1 = NORMAL. 2 = NORMAL-SOFT. 3 = SOFT-NORMAL. 4 = SOFT. 5 = GRITTY. 6 = VERY SOFT.

5/ REFER TO REFERENCE MIXOGRAMS FOR NUMERICAL CURVE PATTERN. 11 = VERY WEAK --- 11 = VERY STRONG!

6/ 1 = BUCKY. 2 = VERY ELASTIC. 3 = ELASTIC. 4 = ELASTIC-PLIABLE. 5 = PLIABLE-ELASTIC. 6 = PLIABLE. 7 = PLIABLE-WEAK. 8 = WEAK-PLIABLE. 9 = WEAK. 10 = VERY WEAK. 20 = SLIGHTLY DEAD. 30 = DEAD.

7/ XXX.9 = BRIGHT WHITE. XXX.8 = WHITE. XXX.7 = SLIGHTLY CREAMY. XXX.6 = BRIGHT CREAMY. XXX.5 = CREAMY. XXX.4 = VERY CREAMY. XXX.3 = GRAY. XXX.2 = DULL GRAY. XXX.1 = VERY GRAY.

8/ XXX.00 = BIGGY. XXX.01 = THICK WA-- 33 HORSH. XXX.03 = CLOSE. XXX.05 = OPEN. IRREGULAR. XXX.09 = OPEN.SLIGHTLY IRREGULAR. XXX.37 = IRREGULAR.OPEN. XXX.39 = OPEN. (XX.1? = IRREGULAR. XXX.3) = SLIGHTLY OPEN.IRREGULAR.
XXX.98 = SLIGHTLY IRREGULAR.OPEN. XXX.?3 = SLIGHTLY OPEN. XXX.93 = SLIGHTLY IRREGULAR. XXX.99 = NORMAL.

9/ 1 = NO PROMISE. 2 = LITTLE PROMISE. 3 = SOME PROMISE. 4 = GOOD PROMISE.

TABLE 15

QUALITY DATA OF INTERNATIONAL NURSERY SAMPLES

1993 CROP

VARIETY OR SEL. NO.	T.W. 14% MB.	1000 KWT. G.	KERNEL LG %	KERNEL MED %	KERNEL SM %	WHT. MTN. %	WHT. PHO. %	KERN. CHAR. %	FLR. ERT. %	MIN.@ 65%EX. %	FLR. SED. %	MLG CHAR. %	MLG. SED. %	MIX. GIS. %	MIX. PAT. %	BAKE ABS. %	MIX. TIME MIN.	DOUGH CHAR. %	CRUMB COLOR %	CRUMB GRAIN %	LOAF VOL. CC.	BAKE EVAL. %	GEN. EVAL. %	MINOR DEFICIENCY				MAJOR DEFICIENCY
ST. PAUL, MINNESOTA																												
43V GHRAIB 5	58.0	24.4	2	95	13	1.68	12.8	5	5A.0	0.57	11.5	1	4	68.5	4	68.3	3.75	6	103.6	89.33	161	4	2	WP	EX	DD	LV	
A_3VORA "S"	55.3	28.4	6	89	5	1.98	12.5	5	52.9	0.57	11.5	1	8	59.3	3	59.8	4.88	6	100.5	89.83	171	4	1	WP	DD			ER MA5
ANZA	57.5	26.2	5	88	9	1.78	12.6	4	56.7	0.57	11.5	1	2	57.5	1	57.5	2.50	6	121.5	89.97	154	8	1	WP	BA	MI	DD	LV
E34	56.3	23.2	2	87	11	1.91	13.7	2	57.2	0.88	12.9	1	3	59.3	6	59.3	5.25	5	133.3	86.85	181	2	4					
JUNCO "S"	57.5	28.0	14	79	7	1.69	14.0	2	54.9	0.44	12.5	4	8	55.1	10	58.1	7.50	5	115.9	85.89	194	4	1	BA				ER
KLEIN CHAMAC	63.3	22.5	2	81	17	1.73	15.9	2	56.5	0.55	12.9	1	2	60.3	10	63.3	7.75	4	130.8	87.09	193	4	3	DD				
MAMISSA	57.0	26.8	6	86	8	1.89	13.3	2	48.2	3.43	11.9	4	8	55.7	11	65.7	9.88	20	132.8	88.09	149	8	1	MI				ER BA D3 LV
NACOZARI 76	53.3	27.8	6	85	9	1.76	15.1	3	54.8	0.59	12.3	3	5	59.8	3	59.3	4.25	6	131.8	89.99	164	4	3	ER	DD	LV		
PAYON "S"	60.8	27.3	4	90	6	1.79	13.4	1	56.9	0.57	12.8	1	2	56.7	7	55.7	6.83	9	100.8	89.99	178	8	1					BA
PAYON "76"	60.3	28.7	6	88	6	1.78	13.6	8	56.7	0.53	12.1	1	2	57.5	6	57.5	6.48	8	132.8	88.99	176	8	2	PD	BA	3D		
TESIA I 79	66.8	24.8	6	87	7	1.83	12.9	4	64.6	0.65	11.8	1	5	59.1	2	59.1	5.75	6	131.5	88.18	164	6	1	WP	EX	M65	BA	3D LV
VESAY "S"	59.8	25.8	2	82	16	1.86	15.6	2	62.3	8.58	12.6	2	8	56.5	4	56.1	4.25	6	132.5	89.99	152	8	1	DD	LV			ER 84
WO 2172	59.8	29.7	6	86	8	1.74	12.5	4	57.9	0.55	11.3	1	2	63.8	6	68.8	5.75	6	101.8	88.99	168	4	3	WP	PD	DD		
WW 7305	56.3	23.1	4	88	8	1.88	14.6	2	59.4	0.58	14.8	1	2	62.5	5	57.5	6.75	5	133.8	87.87	208	3	4	DD				
U.T. 4881	59.8	25.2	4	88	8	1.83	15.1	5	55.5	0.55	11.8	1	5	61.9	5	61.9	3.58	5	108.5	88.99	188	1	4					
U> 202	63.8	35.1	98	60	2	1.79	14.6	1	56.8	0.52	13.8	1	2	63.5	5	63.5	4.83	5	132.8	88.19	198	4	3	P3	3D			

1/ CLEAN DRY - SUBTRACT 1 LB./BU. FOR OBCRAGE-FREE T.W.

2/ 14% MOISTURE BASIS.

3/ 1 = VERY SATISFACTORY, 2 = SATISFACTORY, 3 = SATISFACTORY-QUESTIONABLE, 4 = QUESTIONABLE-SATISFACTORY, 5 = QUESTIONABLE, 6 = QUESTIONABLE-UNSATISFACTORY, 7 = UNSATISFACTORY-QUESTIONABLE, 8 = UNSATISFACTORY.

4/ 1 = NORMAL, 2 = NORMAL-SOFT, 3 = SOFT-NORMAL, 4 = SOFT, 5 = GOOEY, 6 = VERY SOFT.

5/ REFER TO REFERENCE MIXOGRAMS FOR NUMERICAL CURVE PATTERN. (1 = VERY WEAK --- 11 = VERY STRONG)

6/ 1 = BUCKY, 2 = VERY ELASTIC, 3 = ELASTIC, 4 = ELASTIC-PLIABLE, 5 = PLIABLE-ELASTIC, 6 = PLIABLE, 7 = PLIABLE-WEAK, 8 = WEAK-PLIABLE, 9 = WEAK, 10 = VERY WEAK, 20 = SLIGHTLY DEAD, 30 = DEAD.

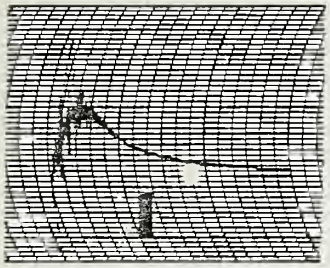
7/ XXX.9 = BRIGHT WHITE, XXX.8 = WHITE, XXX.7 = SLIGHTLY CREAMY, XXX.6 = BRIGHT CREAMY, XXX.5 = CREAMY, XXX.4 = VERY CREAMY, XXX.3 = DARK, XXX.2 = DULL GRAY, XXX.1 = VERY GRAY.

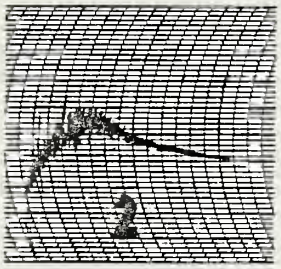
8/ XXX.80 = SOGGY, XXX.81 = THICK WALL OR HARSH, XXX.33 = CLOSE, XXX.35 = OPEN, IRREGULAR, XXX.86 = OPEN,SLIGHTLY IRREGULAR, XXX.87 = IRREGULAR,OPEN, XXX.89 = OPEN, XXX.10 = IRREGULAR, XXX.30 = SLIGHTLY OPEN,IRREGULAR, XXX.58 = SLIGHTLY IRREGULAR,OPEN, XXX.73 = SLIGHTLY OPEN, XXX.90 = SLIGHTLY IRREGULAR, XXX.99 = NORMAL.

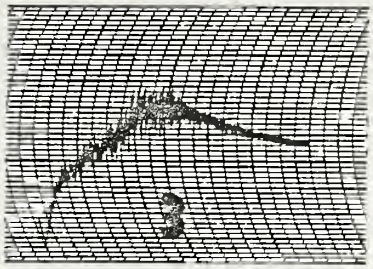
9/ 1 = NO PROMISE, 2 = LITTLE PROMISE, 3 = SOME PROMISE, 4 = GOOD PROMISE.

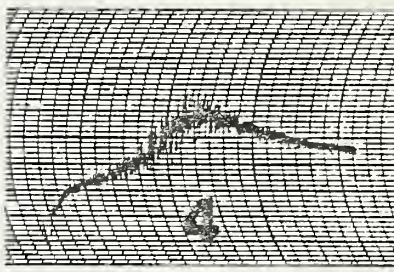
REFERENCE MIXOGRAMS

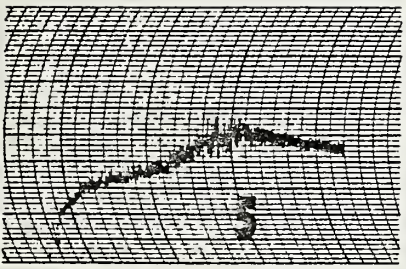
HARD RED SPRING WHEAT

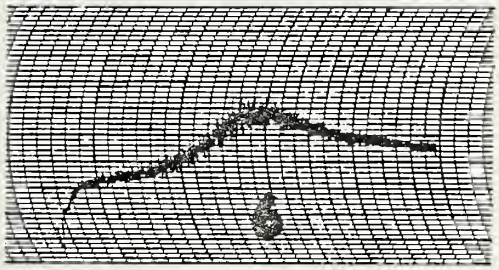


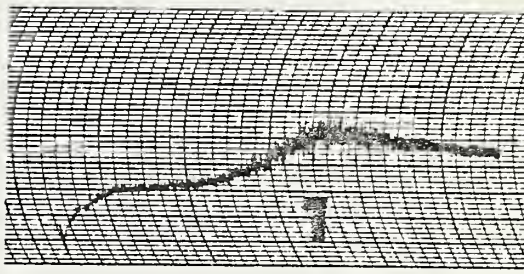


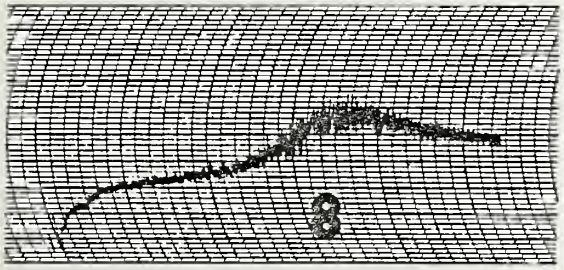


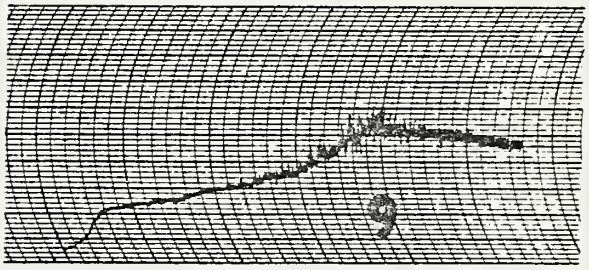


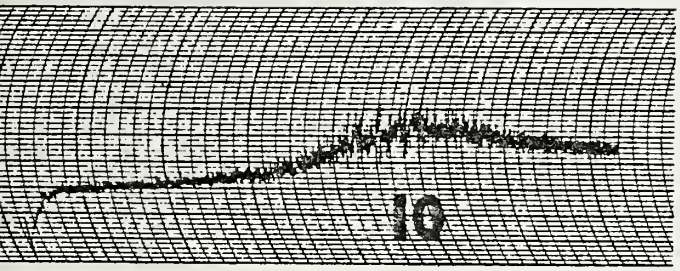


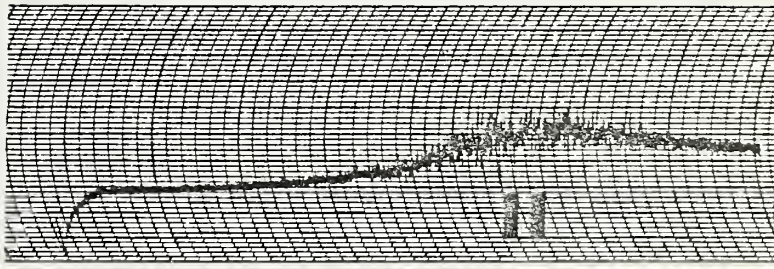












U.S.D.A. SPRING WHEAT QUALITY LABORATORY

FARGO, NORTH DAKOTA